

## FELIX ROMULIANA – AN ARCHAEOASTRONOMICAL RESEARCH

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**Abstract:** This paper is an attempt to determine the festivals celebrated in Felix Romuliana using archaeo-astronomical methods. Some deities considered protectors of its inhabitants are known. Some iconographic artworks were found at the site in the form of sculptures, reliefs or mosaics, pointing to the worship of Dionysus and Ariadne, Jupiter, Hercules and Aesculapius and probably Demeter and Hecate. The assumption that their festivals were determined by observing the Sun and the stars was checked (after a geodetic survey of the horizon) using the astronomical software RedShift 7 and PLSV. The observation points were determined according to the rules of Roman architecture. The mutual relations of the buildings of the sacred funeral complex were examined and a number of astronomically important directions were found.

### 1. INTRODUCTION

Felix Romuliana is a late-ancient complex of buildings, built during the era of tetrarchy. It was constructed by the order of Gaius Galerius Maximianus Augustus, the Roman Emperor (c. 260 – 311 AD), at the place of his birth, near today's Gamzigrad, in the eastern part of Serbia, and named after his mother, Romula. The origin of this Roman emperor is not Roman: a father whose name is not preserved was a Thracian while his mother was a Romanized Dacian.

The complex of buildings in Felix Romuliana consists of two parts: fortification with two residential palaces, two temples, together with a bath (Termae) and a granary; the other part is a sacral and funeral complex, located east of the fortification, on the hillock named Magura, with two tumuli, two mausoleums, an insufficiently studied and unpublished building and a Tetrapilon. Archaeological research was carried out by a team of archaeologists led by D. Srejiović.

Roman planning of cities and military camps followed some strictly defined rules<sup>1</sup>. According to Vitruvius, the north-south direction (lat. *Cardo*) was to be determined first. After that, east-west direction was determined, named *Decumanus*. Two main streets of the city (or the camp) followed these directions, named *Cardo Maximus* and *Decumanus Maximus*. The main geodetic point of the city, called *GROMA* or *Umbilicus* (“navel”) was at the juncture of these two streets. As a rule, the main gate of the city was in the east, called *Porta Praetoria*. There was also a second gate, in the west, called *Porta Decumana*. The latter most often led to the sacral-funeral complex, which was located west of the city (or the camp). Depending on the configuration of the terrain, it may have been possible to deviate from these rules to a certain degree, but never significantly.

At first glance, it is obvious that the plan of Felix Romuliana deviates significantly from these rules: first, the north-south direction (*Cardo*) can not be identified in the residential complex. There is only one street, *Decumanus Maximus*, following east-west direction. There is no intersection of the two main streets. So, the position of *GROMA* is quite uncertain. This main geodetic point was usually marked by a flat, square stone, with a carved line on its upper surface pointing to the north, and such a stone was not identified at the site. The second deviation refers to the demolition of the older fortification followed by the construction of a new one. Knowing that fortifications were traditionally considered sacred by the Romans, it is quite unclear what reasons could have led Galerius to do so. Why was the place of the western gate of the complex changed? It is also unusual that the sacral-funeral complex is to the east of the residential one. The existence of tumuli at the Roman site is also unique. Tumuli were usually built by the Thracian, the Dacian and the Macedonian rulers, and not by Roman emperors. Should the reasons for these deviations be sought in the non-Roman emperor's origin? Are some non-Roman traditions together with some local, non-Roman knowledge embedded in the foundations of Felix Romuliana?

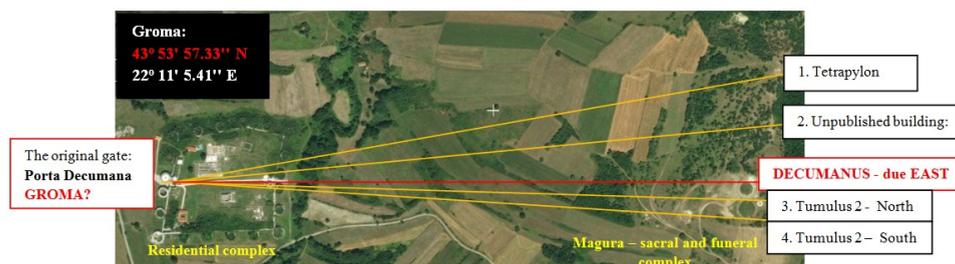
## 2. WHERE IS THAT GROMA (UMBILICUS)?

As *Cardo* is absent, *Groma* could be somewhere on the *Decumanus* road. The eastern gate is located on a low position, it is 11 m lower in respect to the western one. It is not practical for *Groma* to be there. On the contrary, the original Western Gate (*Porta Decumana*) is the highest point of the complex, the view to the terrain is excellent as seen from there. The place is quite convenient to be the main geodetic point. This hypothesis was the first one tested in this paper by the archaeoastronomical method, in order to discover some sense of its position. The Google Earth and Zoom Earth satellite maps were used to identify geographical coordinates of points of interest. To transform the coordinates into all three systems, the Geotrans and Coordinate transformer Chuck Taylor software were

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<sup>1</sup> Vitruvije, *Deset knjiga o arhitekturi* (2014, prevod Matija Lopac 1951), Orion art, Beograd (Vitruvius, *Ten books on architecture*).

used. Using of WGS 84/UTM coordinate system, which expresses the geographic coordinates in meters, gives the possibility of calculating the azimuths of directions and the distances between the individual points; data on altitudes are available on the maps of the site created by Dragoslav Srejović's team, as well as on the maps of Military Geographical Institute of Serbia. These data allow the calculation of altitude differences and angular heights of certain points on the horizon. Astronomical software Red Shift 7 and PLSV (Planetary, Stellar and Lunar Visibility) were used to define astronomical events in the given directions. In the end, a geodetic survey was performed from the hypothetical *Groma*, in order to check the calculated values of azimuths and the angular heights of some distinctive points on the horizon.



**Figure 1:** Groma and the directions towards the structures on the natural horizon.

The hypothetical *Groma* is located on the following coordinates: **43° 53' 57.33''N 22° 11' 5.41'' E**. It was noticed the northernmost point of the smaller tumulus is at the same latitude (**43° 53' 57.33''N 22° 11' 59.92'' E**). These two points define the *Decumanus* of the complex. The eastern horizon on Magura is well structured: the trough which contains the remains of Tetrapylon is visible; both *tumuli* and Mausoleum 1 (the Mausoleum of Romula, the emperor's mother) are clearly visible; Mausoleum 2 (the Mausoleum of Galerius) is obscured by Tumulus 2. About 200 m north of the smaller tumulus, there are the remnants of a big rectangular building of an unexplained purpose, which for now is known to have been richly decorated with mosaics. These remnants are not visible being clogged with earth for the sake of protection, but their position is known - archaeologists have recorded the exact coordinates of the building's corners in the WGS 84 / UTM system, so the azimuth of its direction can be calculated.

Geodetic survey was performed from the hypothetical *Groma* in November 2017. and the following results were obtained:

	azimuth	altitude
<b>Tetrapylon (south)</b>	79° 08' 40''	01° 43' 30''
<b>Unpublished building(south)</b>	84° 21' 36''	02° 41' 19''
<b>Tumulus 1 (north)</b>	90° 00' 00''	02° 51' 10''
<b>Tumulus 1 (south)</b>	91° 09' 20''	02° 50' 40''
<b>Between the Tumuli</b>	91° 17' 40''	02° 50' 30''
<b>Tumulus 2 (north)</b>	91° 31' 50''	02° 50' 00''
<b>Tumulus 2 (south)</b>	92° 54' 30''	02° 44' 50''

\* The calculated values are marked gray, the measured values are marked black.



**Figure 2:** The Sun rise at the beginning of Cerialia on RedShift 7.

Atmospheric refraction has been taken into account. Its average values were used for each month of the year, according to the measurements of Sampson and associates (2003)<sup>2</sup>. The software takes the proper atmospheric refraction on the horizon automatically only if it is plane.

As seen from Groma, the first sunrays appeared at the direction of the right (southern) foot of **Tetrapylon** on April 12, denoting **Cerialia**, the holidays

<sup>2</sup> Sampson, R. D; Lozowski, E. P; Peterson, A. E; Hube, D.P; 2003, Variability of the Atmospheric Refraction of the Rising and Setting Sun, *Publications of the Astronomical society of the Pacific* **115**, 1256 – 1261.

dedicated to Ceres, the goddess of crops. A fragment of the statue depicting Ceres (a hand holding a torch), was identified at the site. According to the famous myth, the goddess held a torch while she was searching her Proserpine, accompanied with Hecate, the protector of crossroads. Tetrapylon is located on a crossroads.

The first sunrays appeared at the southern point of Tumulus 2 on March 19, marking the beginning of *Quinquatrus*, the holiday of Minerva, the goddess of war and strategy. Galerius the Emperor was both: a warrior and a strategist. Minerva was to be worshiped.

When the Sun rose at the northern point of Tumulus 2, *Quinquatrus* ended and *Tubilustria* begun.

As seen from *Groma*, the Sun rose at the direction of the unpublished building on April 4, the day of Megalesian Cybele, the protectress of fortifications.

In 307.AD, Galeria Valeria was honoured with the title „*Mater Castrorum*“, (“Mother of fortifications”) suggesting her identification with Cybele, the goddess. One assumption could be that the unpublished building was intended to be the Mausoleum of Valeria Galeria, the emperors wife.

According to the Orphic myth, when the first Dionis, Zagreus (the son of Zeus and Persephone) was born, Zeus was aware of the danger that threatens the divine boy from his jealous stepmother, Hera. So he gave him to Hermes, who took the child to Mount Ida and handed him over to Cybele<sup>3</sup>. Thus, the goddess became the protector of Dionysus (Zagreus).

This position of the Sun, that marks the Cybele’s festival, was determined by its centre, unlike the previous two cases, where it was determined by its first rays. This could have some significance, and will be discussed later.

Thus, the hypothetical *Groma* gets its astronomical meaning, as the point from which sunrise was observed in order to determine certain Roman festivals. Ovid reported in detail about the position of festivals in the Roman calendar in his work *Fasti*, giving his readers clear explanations that many of those were determined according to astronomical events.

Felix Romuliana is far from Rome. There were no libraries available there either, and the announcements of the high Roman clergy couldn't quickly be transferred to the place. Its inhabitants apparently had to determine their own festivals by themselves.

It is interesting that all the festivals determined by observing the Sun from the *Groma*, are dedicated to female deities. Likewise, it is notable that not all surveyed points on the horizon (covered by geodetic survey) were relevant, but only three of those. It could therefore be assumed that some of these points are important for some other observation points located in the residential complex. Temples are the first free association. Therefore, the following question was raised:

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<sup>3</sup> Nonnus, *Dionysiaca* 9. 136 ff :

### 3. WHAT WAS TO BE OBSERVED FROM THE TEMPLES OF FELIX ROMULIANA?

#### 3.1. The bigger temple

Within the fortification with the residential complex, two temples were identified: the larger one is south of *Decumanus Maximus*. It was considered to be dedicated to Jupiter, the supreme Roman deity. The smaller one is located in the northern part of the fortification, close to its northern wall, presumably being dedicated to Liber and Libera (the Roman equivalent of Greek Dionysus and his wife Ariadne). The first assumption is based on historical facts: Galerius was the adopted son of Diocletianus who was considered the earthly incarnation of Jupiter.



Figure 3.

It was Diocletianus who founded the system of tetrarchs in Roman Empire, adopted Galerius as his son and appointed him as Caesar in 293 AD. After his withdrawal from power in 305 AD, he gave his adopted son the title of Augustus. Jupiter's cult is attested in Felix Romuliana: the marble head of Jupiter and his left foot were found at the site. Based on the size of these remnants, the statue was about 6 m high.

It is not allowed and it is not possible to climb into the larger temple and to install a theodolite there. So the examination of the temple was done by identifying the central point at the back of the hall, to the opposite of the doors. Its coordinates are;  $43^{\circ} 53' 56.26'' N$   $22^{\circ} 11' 09.88'' E$ . The axis of the temple is on the azimuth  $A = 86^{\circ} 56'$ . Looking in that direction one can see the northern foot of the Mausoleum 1 (the Mausoleum of Romula). The calculated height of the horizon is  $h = 3^{\circ} 24''$ .

According to Red Shift 7, the Sun rose on the given azimuth on September 13<sup>th</sup>, the day of Ides and the day of *Epulum Iovis* – The feast of Jupiter. Its upper left quarter was observed on the left (northern) foot of Romula's Mausoleum:

Symbolically, Jupiter, taking the form of the Sun (the golden dragon) „visited“ Romula on the day of his feast. Just like he „visited“ Proserpine (Persephone) in the Orphic myth, in the form of a dragon, conceiving Dionysus Zagreus, the first incarnation of Dionysus (Liber).

The position of the Sun was determined by its centre again. This could have some significance, and will be discussed later.

According to Lactantius, Galerius was spreading the story that his mother had been fertilized by a dragon to give the emperor's birth. Such story would be strengthened if the day of Galerius' birth, which is not known, was nine months after the Ides of September, i.e. about the Ides of Jun.

Whatever, This story of Lactantius may be first indication that the emperor was identified with Liber (Dionysus).

The cult of Liber (Dionysus) was richly attested archaeologically in Felix Romuliana by the discovery of a magnificent mosaic, with the image of the deity. His divine wife Libera (Greek Ariadne) is also present on the relief depicting her figure. It's the same Ariadne, the daughter of Minos from Crete, who gave Theseus the famous thread to get out of the labyrinth in which he killed Minotaur, the monster with a bull's head. After that event, they fled from Crete together, as Theseus promised to marry her. They stopped on the island of Naxos to restore their water supplies. According to the myth, Ariadne had fallen asleep and Theseus fled away towards Mycenae leaving her on the island. There she was noticed by Dionysus. The god fell in love, and she became his wife. Of course, a mosaic with a maze was also discovered in Felix Romuliana.

### 3.2. The smaller temple

It is possible to enter the smaller temple, its staircase is preserved. But it is not allowed, so the examination was done in a similar way as with the bigger one. The coordinates of the central point at the depth of the temple (to the opposite of its entrance) are given in the picture. The axis of the temple is on the azimuth  $A = 94^{\circ} 36'$  and the calculated height of the horizon in that direction is  $h = 3^{\circ} 22'$ .



Figure 4.

On March 17, the day of *Liberalia*, the upper pole of the Sun rose exactly between the two tumuli, above the altar, as seen from the smaller temple.

The two tumuli are the most impressive structures on the eastern horizon. Such a sunrise had to look magnificent. On March 17<sup>th</sup> 2018. we went to the site to take a photo of it, but we were not lucky: the sky was cloudy. Anyway, the assumption that the smaller temple was dedicated to Liber (Dionysus) becomes more firmly founded.

All these results lead to the following question: Was the sacred-funeral complex on Magura<sup>4</sup> also measured by celestial measures? Today, this hill is called Zvezdan, just like the nearby village. The name is derived from the Slavic (Serbian) adjective, which means "starry". The fact that Magura was the place for star gazing is still preserved in the local toponomastics.

### 3.3. The sacral and funeral complex

What was once called Magura is a flattened hillock, 252 m high. There are two *Tumuli* on its top, together with two Mausoleums. Other buildings on the same hill are on its slopes, at much lower elevation. *Tumuli* and Mausoleums are at the most dominant features of the hill. The smaller, northern Tumulus is 36 m in diameter. It is 4-5 m high, enclosed by a stone fence about 1.5 m preserved height. Mausoleum 1 is next to it, presumed to belong to Romula. The larger, southern Tumulus is 40 m in diameter, about 1-2 m higher in respect to the first one. Mausoleum 2 is in the vicinity, presumed to belong to Galerius. Both the Mausoleums are poorly preserved, the foundations and core of the base only. The base of Mausoleum 1 was in the shape of a four-pronged prism with an octagonal *Coela* above. The base of Mausoleum 2 was a prism with twelve angles, crowned by 12 pillars surrounding a cylindrical *Coela*. According to the proposal of ideal reconstruction, the whole complex looked like in Fig. 9.

Both tumuli had been the places of funeral pyre<sup>5</sup> and were fully archaeologically explored. A Bronze Age necropolis<sup>6</sup> was discovered below the Roman layer, which means that the site had its sacral importance even then.

Before the ritual of the apotheosis (cremation) of the emperor's mother was performed, the northern tumulus had not been clogged with earth, and it certainly

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<sup>4</sup> According to Romanian researcher Jon I. Russu / Ion I. Russu, (1967) *Limba traco-dacilor*, Editura Științifică, București /, Magura is a word from the Dacian language, meaning "hill" or "hillock". There is a cave with the same name in Bulgaria, which contains prehistoric drawings, considered to be "notes" of celestial phenomena. There is a village with the same name in today's Romania, near the town named Bran (and Bran is the name of the Celtic solar deity), as well as the village of Magura in Kosovo, west of Lipljan, near the Roman Ulpiana. Thus, the term "Magura Hill" is actually a pleonasm.

<sup>5</sup> Popović, Ivana i grupa autora, (2010) *Felix Romuliana – Gamzigrad*, Arheološki institut, Beograd, Posebna izdanja 47. (the article: Ivana Popović, *Sakralno-funerarni kompleks na Maguri*, p. 141)

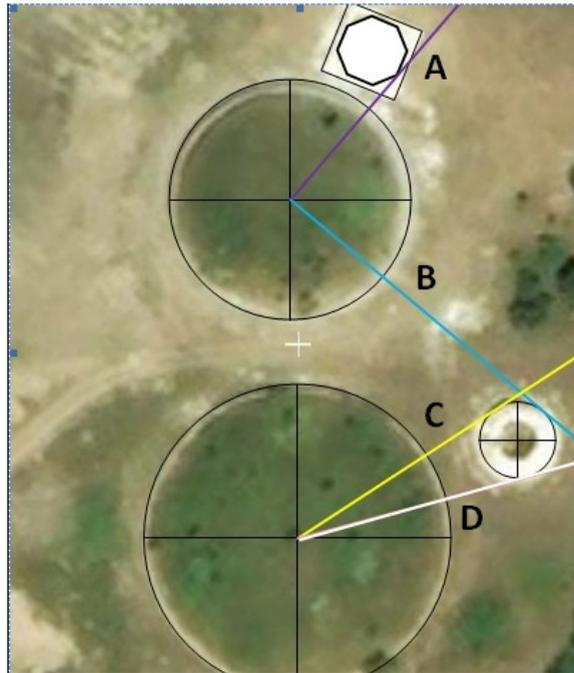
<sup>6</sup> Idem.

existed because its northern and southern points were the important landmarks for the construction of the residential complex structures. The northern one defined the *Decumanus*, so it had to be established very early, practically before the construction of any other building. Therefore, given the circular shape of its fence, it can be assumed that it was originally the place for sky observing in the conditions of a flat artificial horizon, provided by the stone fence reaching the height of the observer's eyes.



**Figure 5:** Ideal reconstruction of the sacral-funeral complex on Magura, a view from the north.

A similar assumption can be applied to the second, southern tumulus, which could have the same function. This hypothesis can be examined in a similar way as it was done with the temples in a residential complex. It can be imagined that there are no tumuli but two circular formations with fences only, together with two buildings intended to be Mausoleums (or at least the foundations of these).



**Figure 6:** The picture shows four well established directions (A,B,C,D) that define the relationship between circular formations and Mausoleums. They are marked with different colours.



**Figure 7:** This is the rising direction of Corona Borealis, the constellation known since the ancient times. This constellation had its significance in the cult of Liber and Libera (Ariadne, the Dionysus' wife).

According to the myth, it was the crown, given to Ariadne as the wedding gift, when she married Dionysus. It was forged by Vulcan (Greek Haephaestus) and was ascended to the heaven as the memory of the happy event.

According to the astronomical software PLSV (Planetary, Stellar and Lunar visibility), In the third century AD, Corona Borealis<sup>7</sup> had its evening rise exactly on March 17<sup>th</sup>, the day of *Liberalia*, the main holiday of Liber and Libera.

**The direction B** on the picture is a tangent from the centre of the northern tumulus to the basis of the Mausoleum 2. It is on the azimuth  $A = c. 131^\circ$  and the horizon altitude is  $h = 0^\circ$

It was a quite unexpected finding: Southern Major Lunar Standstill moonrise. The Moon's first rays appeared by the left (north-eastern) foot of the Mausoleum 2, as seen from the centre of the smaller circle. Then it was partly obscured by the Coela while some of its surface was visible between the pilars and Coela. After that, it rose again on the other (south-western) side of the Mausoleum 2.

There is no evidence that Lunar standstill had any significance in the Roman religion. It was important for Bronze age Celts. But, Celts (Scordisci) lived in this area before the Roman conquest. They mixed with the indigenous Thracians and Dacians, forming the tribe named Pikensians\*, mentioned in historical records to inhabitate the area in the 2<sup>nd</sup> century AD. So, it is possible that the knowledge on Lunar Standstills thus became familiar to the local priesthood.

According to Red Shift 7, the astronomical software, 295. AD was the year of the Major Lunar Standstill which happened on June 14.

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<sup>7</sup> The name of the Northern Crown in Dacian language is not known. However, there is one assumption that needs to be examined. The ancient Balts called this constellation Darželis (which the researchers translated as the "garden"). In the Hellenistic period of Greek history, in Odesos (now Varna, Bulgaria), the Thracians and Dacians worshiped the deity named Darzelas (or Darzalas), whose name was noted on the numerous coins minted in Odesos. The deity was considered chthonic, the bringer of abundance, fertility and masculinity. There was also a temple dedicated to him in Histria (today's Constanta in Romania). In his honor, games were held every four or five years (Darzeleia). According to Wikipedia (article: Thracian language), the word "zelas" means "wine", so it is possible to link Darzelas with Dionysus. The Old Balts' name for the asterism Hyades was Dievo Darželis, and the Hyades were the nymphs that nurtured Dionysus on the Mount Nisa. (*The Cosmology of the Ancient Balts*, authors: Stražišys, V. & Klimka, (1997) L. *Journal for the History of Astronomy, Archaeoastronomy Supplement*, Vol 28, pp. 57-80) The past paleolinguistic research assumes the connection of Dacian, Thracian and Baltic languages.

\*Popović, Ivana i grupa autora, (2010) *Felix Romuliana – Gamzigrad*, Arheološki institut, Beograd, Posebna izdanja 47. (The article: Miodrag Sladić, *Gamzigrad u protoistoriji*, p. 31)



**Figure 8:** Lunar standstill.

Dragana Radovanović, the archaeologist, states that the probable year of Romula's death was 295AD. She found a collection of Roman gold coins at the place of Romula's cremation (smaller circular formation) and none of these coins were minted after 294. AD. Did someone find a way to make a record of Romula's death date astronomically? If it is so, then his record is very hard to extinguish, either by robbers or by the ravages of time.

But, there is another possibility, as the blue line makes a connection of the place of Romula's funeral pyre with Galerius' Mausoleum. That could also be the note on Galerius' birth. The same astronomical event happened in 258. AD, on June 3<sup>rd</sup>. As it is already mentioned, the emperor spread the story that his mother had been fertilized by a dragon, probably on the day of *Epulum Jovis* (the Ides of September) to give the birth of her son. So, the birth is supposed to come nine months later, about the Ides of June. The other directions on Magura have to be tested.

**The direction C** is on the azimuth  $A = c. 55.5^\circ$   $h = 0^\circ$ . It is the azimuth of summer solstice sunrise on June 21. 295, in terms of a flat horizon, as seen from the centre of the larger circular formation. The upper left quarter of the Sun appeared by the northern foot of the Mausoleum 2. It was not necessary to apply the correction for the atmospheric refraction on the horizon. It was applied automatically by the software itself, as the horizon is plane.

In his poem *Fasti*, (book VI), talking about this date, Ovid told the myth about the death and resurrection of Hypolitus. It is indeed a very convenient story for a funeral complex. Life and afterlife, death and apotheosis...

Now, it can be assumed that the direction of the southern lunar standstill was the last one determined from the centre of the smaller circular formation, on June 14. 295. AD. It had probably been done right after Romula's death, before the ritual of apotheosis was performed.

There is only one **direction D** left. It is on the azimuth  $A = 73^{\circ}$ - $73.5^{\circ}$  and  $h = 0^{\circ}$ . It was the rising azimuth of Hyades, the asterism in Taurus in the third century AD.

According to the myth, Hyades were sisters. They were the nurses of Liber (Dionysus) when he was a child, hidden on the Mount Nyssa, to be saved from Junona's (Hera, his stepmother) rage. So, the asterism could have its significance in the cult of Liber.

According to PLSV, the astronomical software, the apparent morning rise of Aldebaran, the brightest star in the asterism, was observed on June 11<sup>th</sup>, during the life span of Galerius. This date was the holiday named *Matralia*.

It was dedicated to *Mater Matuta*<sup>8</sup>, also known as Ino, Leucothea or Galatea, the sister of Semele, Dionysus' mother. She was also one of the nurses of Liber, his aunt and his stepmother. So, if Galeius was born in June 258. AD, he had an additional point to strengthen the believe of his connection with Liber.

We note as well that according to Lactantius<sup>9</sup> the Christian writer, Romula "organized sacrificial feasts with her peasants" very often. If she did it "with her peasants", she was often somewhere in a village. Felix Romuliana is imposed as that village, because it is the place where the peasants are "hers". This leads to the assumption that there was a local clergy, to which she may had been a member, taking into account her high hierarchical position of the emperor's mother. The feasts had to be held before 295, because it was the year of her death. At that time, there had to be a small village villa for her in Felix Romuliana, and two circular formations on Magura had been already built. If it is assumed that the construction works started in 293, it was a logical time to begin geodetic surveying and planning. As Galerius was very busy fighting and building his military and political career at the time, the only person of his confidence, who could have a direct control of the works, was his mother.

Really, this research has shown two types of astro-geodetic survey: the earlier one, empirical by its nature, relied on the first rays of the Sun. Considering that the author determined the direction of the major southern lunar standstill, it can be assumed that he was of local origin. It was the man of Romula's trust. The later one was probably done in 307. AD. It was oriented towards the centre of the solar disk, and its author probably also knew certain astronomical calculations. This second surveyor (and astronomer) determined three directions only: the direction of the sunrise on the Megalesian Cybele's day as seen from *Groma*, in order to determine the position of the Mausoleum for Valeria, the emperor's wife; the

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<sup>8</sup> Ovidije, *Fasti*, (2016. Preveli i komentarisali Aleksandra Bajić i Milan Dimitrijević), Društvo "Vlašići", Beograd (Book 6).

<sup>9</sup> Popović, Ivana i grupa autora, (2010) *Felix Romuliana – Gamzigrad*, Arheološki institut, Beograd, Posebna izdanja 47. (the article: Aleksandar Popović, *Pisani izvori o Galeriju*, p. 215. The author explains that the word, translated as "peasants" was actually the Latin word "*vicani*", which means "villagers")

direction of the summer solstice sunrise, observed from the centre of a larger circle on Magura, in order to determine the definitive form of Galerius' Mausoleum; and the third, the direction of sunrise on the day of *Epulum Jovis*, in order to determine the exact position of the Temple of Jupiter.

Further research could help to find the exact order of construction of individual buildings of the complex, but this goes beyond the tasks of this paper.

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