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Progress Report

AUTOMATIC SHAPE RECOGNITION OF TYPE III RADIO BURSTS IN SOLAR WIND DYNAMICAL RADIO SPECTRA

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Modern technology is particularly vulnerable to various aspects of space weather. Radio spectrograph instruments are used to monitor the suns coronal emissions of plasma that travel with solar wind towards the Earth. Dynamical radio spectra are detected by radio observatories in space and around the world producing a huge amount of data. An automatic detection of potentially dangerous event travelling toward the Earth is extremely important. The focus of this work is on the automated detection of Type III radio bursts. The physical mechanism causing this type of bursts is related to energetic electrons propagating along magnetic field lines in the solar corona. As these beams escape upward into interplanetary space, away from the solar corona, they encounter decreasing plasma density which results in a decrease in the radio frequency which gives the Type III bursts their characteristic decrease in frequency with time. Data from WIND spacecraft are used to test and validate the method. The development of an automated detection was motivated by the ability to rapidly find solar radio events in archives. Type III radio bursts occur frequently so the database of these events is quite large. An algorithm for identification of shapes of type IIIs embedded in complex background is developed.