I. SPECTRAL LINE SHAPES INVESTIGATIONS IN YUGOSLAVIA AND SERBIA 1989--1993

Two previously published Bibliographies with citation index on Spectral Line Shapes Investigations in Yugoslavia, cover the period 1962 -- 1989 (Dimitrijević, 1990, 1991). From the end of 1989 up to September 1993, 241 articles concerning line shapes investigations have been published by Yugoslav authors (among them 230 by Serbian authors). In Serbia have been published as well 2 Ph. D. and 4 M. Sc. Theses. Consequently, since the first article on this topic (Vujnović et al., 1962) up to the 1993, 869 (684 by serbian authors) bibliographic items have been published by 127 Yugoslav authors(100 from Serbia, 26 from Croatia and 1 living in France).

In the considered period various problems have been investigated. Doppler broadening in a d.c. hydrogen glow discharge has been investigated for Balmer series hydrogen lines (629, 705). Stark broadening of hydrogen and hydrogen-like emitter lines, has been studied in particularly for H-beta line shift (679, 741), and hydrogen line shift in the presence of magnetic field (678, 839). Also, the attention has been paid to the study of H alpha wing assymetry in weakly non ideal plasma (699), to the investigation of hydrogen line shapes in a plane - cathode abnormal glow discharge (791) and other discharges (799, 840) and to the influence of ion dynamics (865).

Work on the experimental determination of Stark broadening parameters of nonhydrogenic atoms and ions has been continued during the considered period: Stark broadening of folowing atoms and ions has been investigated: Ar I, II, III, IV (661, 730, 858, 859); B I, II, III (783, 838, 864); Br I, II (655, 656, 657, 658, 740); C I, II (803, 838); Ca II (862, 863); Cl I, II, III (655, 658, 661); Cd II (688, 724, 725); F I, II, III, IV, V, VII (683, 723, 785, 786, 787, 843, 866); Fe II (795, 856, 857); He I (680, 698, 750, 751, 849, 858, 860); Hg I, II, III (653, 756, 782); I I, II (656, 657, 676, 690); Kr II, III (748); Na I (783); N II, III (731, 743, 781, 838); Ne I, II, III, IV, V, VI (696, 866); O II, III (726, 749, 855, 864); Pb II (756, 782); S II, III (652, 654, 661, 694, 706); Si II, III, IV (727, 784); Sn I, II (651, 782); Xe I, II, III (667, 748), Zn II (724, 745). Also, the influence of ion dynamics (663, 665, 666, 732, 733), magnetic field (680, 849) and plasma non ideality (695) has been investigated .

Using the semiclassical perturbation approach (Sahal-Bréchot, 1969a,b), the spectra of following elements have been investigated: He I (641), Li I (642, 644, 714, 716), Be I (776, 836), Na I (645, 648), Al I (777, 830), K I (647), Cu I (649), Rb I (774), Pd I (806, 810), Be II (765, 769, 823, 825), Ca II (766, 771, 819, 821, 826, 828), Hg II (757, 808), Al III (762, 820, 832), Sc III (767, 821), C IV (717, 719, 772, 773, 775, 778), Si IV (718, 720), Ti IV (767, 821), N V (768, 827), O VI (712, 779), S VI (822, 824), F VII (831, 833), Ne VIII (835), Na IX (835), Al XI (834) and Si XII (834). The influence of the perturber path deflection from straight line, due to the back reaction of neutral emitter on Stark broadening and collision phase shifts, has been investigated (721, 728, 729) as well as plasma screening effects on Stark broadening at the adiabatic limit (634) and the asymptotic behaviour of the Stark broadening A and a functions for attractive hyperbolic paths (643, 770).

Theoretical investigations of non hydrogenic emitter Stark broadening were developed in several directions. An especial effort has been done in order to investigate and test the modified semiempirical method (Dimitrijević and Konjević, 1980). The case of close perturbing levels has been studied in (637) and this approach has been applied to the lines of Bi II (817, 818), Cd II (854), I II (850), Sb II(851), Zn II (854), Pt II (760, 812, 814) and for a number of four and five time charged ion lines (807, 811, 813, 815). Moreover, a simple convergent semiclassical method for evaluation of Stark broadening parameters of neutral atom lines has been developed (636, 722, 762, 816). Approximate methods have been used and tested on numerous examples (630, 631, 707, 670, 780).

A special attention has been paid in a number of papers to the investigation of regularities and systematic trends of Stark broadening parameters (638, 639, 640, 677, 686, 691, 692, 693, 710, 711, 713, 740, 746, 747, 748, 759, 786, 800, 829, 837). Similarities of Stark broadening parameters within the same multiplets (800), supermultiplet (800), transition array (650, 800) and spectral series (710, 711, 759, 829) have been examinated. Also, systematic trends for the same type of transition within a homologous (677, 837) and isoelectronic sequence (713, 786) as well as the dependence of Stark broadening parameters on the ionization potential and on the element ordinal number, giving as the result simple formulae of astrophysical importance (686, 687, 746, 747). An investigation on similarities and regularities for line broadening due to collisions with neutral perturber has also been carried out with the special intention to improve the Van der Waals formula (638, 640, 659, 709).

Astronomical aspects of spectral line shapes research were studied in a number of publications, as the contribution of atomic collisions to the solar limb effect (697, 844), shapes, asymmetries and bisectors of solar and stellar spectral lines (669, 674, 737, 739, 790, 842, 845, 846, 847, 852, 868), Na abundance in Solar atmosphere (691, 734), spectral analysis of a white light flare (798), Fe I lines in the spectrum of Sirius (738), and Stark broadening parameters and abundances in spectra of hot stars (672, 673, 735, 736, 789). On Astronomical Observatory in Belgrade the Belgrade programme for monitoring of activity --- sensitive spectral lines of the Sun as a star, during a 11-years Solar cycle is in the course of realization. In accordance with this programme Solar activity influence on spectral lines has been investigated in several papers (662, 797, 861, 867, 969). Due to need to obtain a better connection between astronomical observations and theoretical interpretations of astrophysical spectra, the radiative transfer investigations have also been carried out (689, 704, 755, 801, 802). Moreover, the influence of the gravitational field on the shape of spectral lines of Seyfert galaxies and quasars and the influence of ion-atom collisions on the absorption of radiation in white dwarfs (793) has been studied as well.

In a number of papers, satellite and diffuse bands of NaCd (628), InHg (685), KHg (660), KCd (659), NaHg(628), satellite bands in the wings of Tl and In resonance lines (660), and metal excimers (684), have been studied. Continua, satellite and diffuse bands have been investigated also (681, 682, 703, 752), as well as laser induced chemiluminescence (753, 754).

Line Shape Investigation in Yugoslavia and Serbia III (1989-1993)

The contribution and influence of Yugoslav and Serbian scientists in the international effort on investigation and interpretation of line shapes illustrated by the bibliography and citation index which follows, may be additionally emphasyzed by the Table 1. Here, scientists with the most bibliographical references in this field in the period 1889 - 1992, according to bibliographies by Fuhr et al. (1972, 1974, 1975, 1978, 1993), are presented.

REFERENCES--- LITERATURA

Dimitrijević, M. S.: 1990, *Line Shapes Investigations in Yugoslavia 1962--1985 (Bibliography and citation index)*, Publ. Obs. Astron. Belgrade, Publ. Obs. Astron. Belgrade **39**.

Dimitrijević, M. S.: 1991, *Line Shapes Investigations in Yugoslavia II. 1985--1989 (Bibliography and citation index)*, Publ. Obs. Astron. Belgrade, Publ. Obs. Astron. Belgrade **41**.

Dimitrijević, M. S., Konjević, N.: 1980, JQSRT **24**, 451.

Fuhr, J.R., Wiese, W.L., Roszman, L.J.: 1972, *Bibliography on Atomic Line Shapes and Shifts (1989 through March 1972)*, NBS Spec.Publ. 366, U.S.Dept. of Commerece, Washington D.C.

Fuhr, J.R., Roszman, L.J., Wiese, W.L.: 1974, *Bibliography on Atomic Line Shapes and Shifts (April 1972 through June 1973)*, NBS Spec.Publ. 366, Supplement 1, U.S.Dept. of Commerece, Washington D.C.

Fuhr, J.R., Martin, G.A., Specht, B.J.: 1975, *Bibliography on Atomic Line Shapes and Shifts (July 1973 through May 1975)*, NBS Spec.Publ. 366, Supplement 2, U.S.Dept. of Commerece, Washington D.C.

Fuhr, J.R., Miller, B.J., Martin, G.A.: 1978, *Bibliography on Atomic Line Shapes and Shifts (June 1975 through June 1978)*, NBS Spec.Publ. 366, Supplement 3, U.S.Dept. of Commerece, Washington D.C.

Fuhr, J.R., Lesage, A.: 1993, *Bibliography on Atomic Line Shapes and Shifts (July 1978 through March 1992)*, NIST Spec.Publ. 366, Supplement 4, U.S.Dept. of Commerece, Washington D.C.

Sahal-Bréchot, S.: 1969a, Astron. Astrophys. **1**, 91.

Sahal-Bréchot, S.: 1969b, Astron. Astrophys. **2**, 322.

Vujnović, V., Harrison, J. A., Crags, J. D.: 1962, Proc. Phys. Soc. (London) **80**, 516.

TABLES --- TABELE

Table 1. Scientists with the most bibliographical references in spectral line shapes investigations in the period 1889 - 1992 according to the bibliographies of Fuhr et al. (1972, 1974, 1975, 1978, 1993).

Tabela 1. Istraživači sa najviše bibliografskih jedinica u istraživanju oblika spektralnih linija u periodu 1889 - 1992, prema bibliografijama Fuhr-a i dr.(1972, 1974, 1975, 1978, 1993).

No. - Br.	Name - Ime	No. of references Broj referenci
1-2.	H.R.Griem	107
1-2.	M.S.Dimitrijević	107
3.	J.Cooper	105
4.	N.Konjević	82
5.	J.Purić	70
6.	S.Sahal-Bréchot	53
7.	S.Y.Ch'en	51
8.	J.Szudy	48
9.	E.W.Smith	45
10.	M.Platiša	44
11-12.	J.Labat	41
11-12.	R.W.Lee	41
13.	E.L.Lewis	37
14.	И.И.Собель ман	33