Invited lecture

PROCESSES OF ATOM – ATOM (n – n')-MIXING INFLUENCE ON HYDROGEN ATOM RYDBERG STATES POPULATIONS IN STELLAR ATMOSPHERES

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The $(n - n')$-mixing processes in $H^*(n) - -H(1s)$ collisions, have been considered from the aspect of their influence on of the $H^*(n >> 1)$ atom states in the weakly ionized layers of stellar atmospheres. These processes have been treated by the mechanism of the resonant energy exchange within the electron component of the considered collisional system. It was shown that these processes must have significant influence in comparison with corresponding electron-atom collision processes, on the populations of hydrogen Rydberg atoms in Solar photosphere and lower chromosphere (ionization degree of the order of 10^{-4}). From obtained results follows that the examinated $(n - n')$ mixing processes have to be included in the modelisation of Solar and cooler stars atmospheric plasma.

Invited lecture

RADIO SPECTROSCOPY OF ACTIVE GALACTIC NUCLEI

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Radio spectroscopy offers a number of tools for studying a large variety of astrophysical phenomena, ranging from stars and their environment to interstellar and intergalactic medium, active galactic nuclei (AGN) and distant quasars. Main targets of extragalactic radio spectroscopy are molecular and dust material in galaxies, HII regions, and maser emission originating in the dense, circumnuclear regions. These studies cover all galactic types and span an impressive range of angular scales and distances. Molecular emission, hydrogen absorption and maser lines have become the tools of choice for making an assessment of physical conditions in the nuclear regions of galaxies. In this contribution, some of the recent advances in the aforementioned fields will be reviewed and discussed in connection with future radio astronomical facilities.