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On detection of Balmer-series lines response to accelerated particles in solar flares.

Pavel P. Kotrč

Astronomical Institute, Academy of Sciences of the Czech Republic, Ondřejov, CZ-251 65

Larisa K. Kashapova

Institute of Solar Terrestrial Physics SD RAS, P.O. Box 4026, Irkutsk, 664033 Russia

Yurii A. Kupryakov

Moscow State University, GAISH, Moscow, Russia

Abstract. Comparison of the Balmer series lines with HXR and microwave emissions. are used as tools for study of the chromospheric response to effects of accelerated particle beams in solar flares. It is known from the theoretical simulations of (Kašparová & Heinzel, 2002) that the beam could also influence ratios between the Balmer lines. We study the optical spectra the Hα and Hβ lines and the ratio of the line profiles for several solar flares obtained with a high cadence to find and analyze predicted variations. The profiles extracted at individual kernels during different flare phases are analyzed with respect to the radio and X-ray data. We found that the theoretical predictions of the Hα/Hβ line profile ratios and the observations were in a good qualitative agreement. However, as concerns quantitative correspondence, we found some difference in position of the predicted profile ratio maxima, moment of arising and the duration of the effect, influence of energy cutoff of electron beam. We try to find some explanations for those discrepancies and discuss perspectives of simultaneous observations of Balmer series lines.