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Collisional excitation and emission of H_α Stark multiplet in fusion plasmas[1] YU. RALCHENKO, National Institute of Standards and Technology, Gaithersburg MD, O. MARCHUK, R.K. JANEV, W. BIEL, Institut fuer Energieforschung-Plasmaphysik, Juelich, Germany, E. DELABIE, FOM-Institute for Plasma Physics Rijnhuizen, Nieuwegein, The Netherlands, A.M. URNOV, P. N. Lebedev Institute of RAS, Moscow, Russia — We study the excitation of parabolic Stark states in hydrogen atoms by collisions with fast ions. It is shown that excitation cross sections are very sensitive to the angle between the electric field and the projectile velocity. The calculated collisional data are implemented in a newly developed collisional-radiative model involving parabolic quantum states of hydrogen. Our simulations are shown to explain the frequently observed non-statistical behavior of the H_α component intensities under typical conditions of a motional Stark effect (MSE). A good agreement with the MSE data from the Joint European Torus (JET) for emission of the σ and π components (Mandl et al 1993 Plasma Phys. Control Fusion 35 1373) is obtained for the first time.

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