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Relativistic Many-Body Approach to Calculating Radiation and Autoionization Probabilities, Electron Collision Strengths For Multicharged Ions in a Plasma: Debae Approximation ALEXANDER GLUSHKOV, Odessa University and Troitsk ISAN Russian Acad.Sci., ANDREY LOBODA, LUDMILA NIKOLA, Odessa University — We present the uniform energy approach, formally based on the gauge-invariant relativistic many-body perturbation theory for the calculation of the radiative and autoionization probabilities, electron collision strengths and rate coefficients in a multicharged ions (in a collisionally pumped plasma). An account for the plasma medium influence is carried out within a Debae shielding approach. The aim is to study, in a uniform manner, elementary processes responsible for emission-line formation in a plasma. The energy shift due to the collision is arisen at first in the second PT order in the form of integral on the scattered electron energy. The cross-section is linked with imaginary part of the scattering energy shift. The electron collision excitation cross-sections and rate coefficients for some plasma Ne-, Ar-like multicharged ions are calculated within relativistic energy approach. We present the results of calculation the autoionization resonances energies and widths in heavy He-like multicharged ions and rare-earth atoms of Gd and Tm. To test the results of calculations we compare the obtained data for some Ne-like ions with other authors' calculations and available experimental data for a wide range of plasma conditions.

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