

Method for precise wavelength measurements of spectral lines emitted by middle-Z ions in laser plasma of mineral targets

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In the present work method for precise wavelength measurements (relative accuracy up to 0.001%) of spectral lines emitted by ions of moderate nuclear charges is presented.

It is proposed to use multicomponent minerals simultaneously containing elements with moderate ($Z = 17-25$) and low ($Z \leq 15$) nuclear charges as laser targets. Radiation of the latter ones ensures the presence of H-like ions, spectral lines of which can be used as reference lines for spectra under study. The calculations of possible refer lines were made using new collisional-radiative code, and the principles of material selection was suggested.

The method was implemented to precisely restore a dispersion function of a spectrometer with a spherically bent mica crystal or-quartz as a dispersive element. It is assumed that the final accuracy will be determined by pixel size of recording equipment. The results obtained will be used for planning of the fundamental X-Ray spectra investigations on laser facility ELF creating in NRNU MEPhI.