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Comparison of helium two-step plasma emission with that predicted from measured cross sections[1] C.A. DEJOSEPH, JR., Air Force Research Laboratory, WPAFB, OH, V.I. DEMIDOV, J.C. BLESSINGTON, West Virginia University — Plasma emission from the afterglow of a low pressure, 100% modulated, rf discharge, can originate from collisions between metastable atoms and fast electrons. The fast electrons are generated by collisions between pairs of metastables (Penning ionization of one metastable by another) and collisions of metastables with slower electrons (collisions of the second kind). Using time-resolved Langmuir probe data, we have measured the electron energy distribution function (EEDF) containing these fast electrons in a helium afterglow. The EEDF data were used, along with measured excitation cross sections out of the $2s^3S$ metastable level [1], to predict relative intensities of various He emission lines seen in the afterglow. A comparison between the measured and predicted emission will be presented.
[1] Boffard, J. B., Lagus, M. E., Anderson, L. W., and Lin, C. C., Phys Rev. **A 59** (1999) 4079.

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