Abstract Submitted
for the DAMOP14 Meeting of
The American Physical Society

Absolute rate coefficient for the recombination of W^{18+} ions with electrons: Storage-ring experiment and theoretical calculations K. SPRUCK, Univ. Giessen, Germany, N.R. BADNELL, Univ. of Strathclyde, Glasgow, UK, C. KRANTZ, A. BECKER, MPIK, Heidelberg, Germany, D. BERNHARDT, Univ. Giessen, Germany, M. GRIESER, MPIK, Heidelberg, Germany, M. HAHN, O. NOVOTNÝ, Columbia Astrophys. Lab., New York, R. REPNOW, MPIK, Heidelberg, Germany, D.W. SAVIN, Columbia Astrophys. Lab., New York, A. WOLF, MPIK, Heidelberg, Germany, A. MÜLLER, S. SCHIPPERS, Univ. Giessen, Germany — Within the general effort to provide reliable atomic data for the modeling of fusion plasmas we have experimentally measured and theoretically calculated the rate coefficient for electron-ion recombination of bariumlike W^{18+} ions forming lathanumlike W^{17+}. At low electron-ion collision energies, the rate coefficient is dominated by strong, mutually overlapping recombination resonances. In the temperature range where the fractional abundance is expected to peak in a fusion plasma, the experimentally derived recombination rate coefficient is a factor of about 400 larger than the rate coefficient which is currently recommended for plasma modeling. The extraordinary complexity of the atomic structure of the open-4f system under study makes the theoretical calculations extremely demanding. Nevertheless, the theoretical results agree reasonably well with the experimental findings, which puts confidence into the ability of the theoretical method to generate reasonably accurate atomic data also for other complex ions.

Stefan Schippers
Institute of Atomic and Molecular Physics, Justus-Liebig-University Giessen

Date submitted: 30 Jan 2014 Electronic form version 1.4