Abstract Submitted
for the DAMOP11 Meeting of
The American Physical Society

**Dielectronic recombination of Ar-like Ni ion and satellite lines of K-like Ni ion**[1] PENKA WILCOX, UNR, Reno, NV, ULYANA SAFRONOVA, UNR, NV, ALLA SAFRONOVA, UNR,NV — Dielectronic recombination (DR) is often the dominant recombination process in both astrophysical and laboratory plasmas. The accuracy of DR data and calculations is essential for our understanding of atomic structure and processes in hot matter. In this work the energy levels, radiative transition probabilities, and autoionization rates for [Ne]$3s^23p^53dnl$, (n=4-7), [Ne]$3s^23p^54l'nl$, (n=4-7), [Ne]$3s3p^63dnl$, (n=4-7), [Ne]$3s3p^64l'nl$, (n=4-7), [Ne]$3s^23p^55l'5l$, and [Ne]$3s3p^65l'5l$ states in K-like nickel ($Ni^{9+}$) are calculated by the relativistic many-body perturbation theory method (RMBPT code) and the Cowan code. Autoionizing levels above the threshold [Ne]$3s^23p^6$ are considered. Branching ratios and intensity factors are calculated for the satellite lines and DR rate coefficients are determined for the singly-excited [Ne]$3s^23p^6nl$, (n=4-7), as well as several doubly-excited states. The important contributions from the doubly-excited states [Ne]$3s^23p^53dnl$ and [Ne]$3s3p^63dnl$ ( $n > 7$) to DR rate coefficients are estimated by extrapolation of all atomic parameters. Total DR rate coefficient is derived as a function of electron temperature.

[1]This research was sponssored by DOE under OFES grant DE-FG02-08ER54951 and in part under the NNSA Cooperative agreement DE-FC52-06NA27588.

Penka Wilcox
UNR, Reno, NV

Date submitted: 11 May 2011 Electronic form version 1.4