

Abstract Submitted  
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**Previously Unobserved Emission Lines in Neutral Helium Edge Plasma Conditions** TIMOTHY IMHOLT, Nanostar Inc., ADAM PIRKLE, DANIEL PIRKLE, University of Texas at Dallas, ORLANDO CABARCOS, Nanostar Inc., ERICH GROSS, BRUCE GNADE, University of Texas at Dallas, DAVID ALLARA, The Pennsylvania State University, NANOSTAR INCORPORATED COLLABORATION, UNIVERSITY OF TEXAS AT DALLAS COLLABORATION, THE PENNSYLVANIA STATE UNIVERSITY COLLABORATION — High resolution optical emission spectroscopy can be very useful as a diagnostic technique for identifying atomic and molecular species in a gaseous plasma environment. In our recent studies we have used a 1250M optical emission spectrometer with a high sensitivity CCD camera to characterize microwave excited plasmas of  $^3\text{He}$  and  $^4\text{He}$  isotopes under conditions to produce excited neutral helium species. Spectra were obtained over the 200 to 900 nm range. Using calibration by Neon and Mercury lamps the peaks positions were accurately determined, the lineshapes fit to standard lineshape expressions and the spectra compared with the NIST database. Our data compare accurately with the previously observed lines in the NIST database and in cases where the weaker lines have not been experimentally observed previously our data show excellent agreement with the predicted positions in the NIST database.

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