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Electronic stopping force of 16O and 63Cu ions in Tantalum Nitride thin films by Time of Flight spectrometry

The study of the passage of energetic ions in matter is of interest for our understanding of basic ion-matter interactions and for applications in ion beam based technologies such as Ion Beam Materials Analysis, Ion Implantation, Radiation Detection and Measurement, and so on. The provision of experimental stopping force data is crucial for the continual validation of predictive theoretical models and semi-empirical codes. The work presented here describes the measurement of energy loss of heavy ions (O and Cu) through thin metallic films (TaN) using a Time of Flight – Energy spectrometer (ToF-E). Energy loss measurements are then used to calculate the stopping force. It is shown from the results, that the experimental and theoretical stopping force show the same trend of variation with energy, although there is a clear discrepancy between the experimental and theoretical data. The difference between the experimental results and theory is explained in terms of possible heavy ion induced second order effects in ion-atom interactions

Apply to be
 considered for a student
   award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
   PhD, N/A)?

MSc

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