Abstract Submitted
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Ion Beam Analysis of Thin Films on Silicon and Carbon Substrates[1] PELHAM KEAHEY, J'NAE ZWASCHKA, LUCAS PHINNEY, LEE MITCHELL, KHALID HOSSIAN, JEROME DUGGAN, University of North Texas — Economics is the primary driving force behind the semiconductor industry's quest to make devices smaller and smaller. Such devices as transistors and integrated chips are produced by laying down very thin films of various materials, insulators and conductors, and masking them in such a way to produced the device. Ion Beam Analysis techniques, such as Rutherford Back Scattering (RBS) is commonly used to calculate the thickness of these layers and their integrity. To illustrate this type of analysis Aluminum, Copper and Gold were evaporated onto ultra pure Carbon and Silicon sheets (Figure 1). Using a 2.5MeV VandeGraff accelerator we use RBS with both a proton and alpha particle beam which impinged on the sample in an ultra high vacuum chamber (fig 2). From the data collected from RBS, we used two mathematical techniques and one simulation program to fit the experimental data. Mathematical methods include :1) Using known Rutherford cross section and experimental data 2) Comparing measured peaks to high precision standards. We used the simulation program (SIMNRA) to model the experimental results as shown in the following graphs.

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