1. (50pts) Consider the RBS (Rutherford Backscattering) spectrum shown below taken with 2 Mev He+ ions incident normal to the sample. The sample is a thin Si film deposited onto a higher Z substrate. Which peak is the Si and which is the substrate. What is the substrate and how thick is the Si film? Assume the detector is at a 20 degree angle with respect to the incident beam. The vertical scale is in relative counts. Explain clearly your calculations.
2. (50 pts.) Consider the electron backscattered detector shown below.
A. (25pts.) If the detector electronics allows one to detect signal differences of 1%, can this detector detect a 0.1 atomic number difference at Z= 30? What other information (if any) is needed to make this determination?
B. (25pts.) If we want this detector to be able to filter out all electrons below 1KeV in energy, how thick would the Al metal coating on the detector surface have to be?