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# STATISTICS SEMINAR

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## **Random Fraction of a Biased Sample, *old models and a new one***

### **Abstract**

In materials science, stereological problems occur naturally when 2D pictures are observed, where 3D information is actually required. This talk introduces a model that was developed for precipitates in steel. The model can be called a 'directed cut cylinder model'. In an opaque volume, directed circular cylinders are randomly distributed and a cross section of the volume is observed, perpendicular to the base of the cylinders. Observations then consist of rectangular profiles of (some of the) cylinders. The height of the cut-cylinder is observed exactly; its diameter not, since the cylinder could be cut close to the center or close to the boundary of its base. Aim is to estimate the joint distribution of radius and height of the cylinders based on the observed rectangular profiles.

The model is related to a class of (univariate) models that can be called 'random fraction of a biased sample' models. Examples include the linear probe problem, Wicksell's corpuscle problem and Hampel's migrating birds problem. In this presentation, the model will be introduced and estimation problems posed. Moreover, our approach will be described and some preliminary results presented.

Joint work with Kimberly McGarrity and Jilt Sietsma

**February 17, 2012 - 14:30 - Room c 115**

**You are welcome at the coffee break (room : c 105)**