

### Introductory Comments

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At Oak Ridge we have been concerned for quite some time with the proposition of whether or not it is possible to use a cyclotron as an injector into a ring-type high energy accelerator. This in itself has no direct bearing on this meeting, but it explains why we have been interested in the problem of beam quality.

In discussing this problem with a theorist one immediately encounters the concept of phase-space density of the beam in the cyclotron. If you are an experimentalist you want to try to understand what this means, how you measure it, or what you observe that you can translate it into a concept of the amount of current per unit area and per unit solid angle. This is perhaps an over-simplification which will be commented on later, but at least it is a simple way of visualizing the concept.

Today we have several contributions which are rather heterogeneous in character, and I have only a limited amount of information about the details of what the different speakers propose to talk about; so no very serious effort is made to group the papers in any very systematic way. I thought we would start out by asking for the paper from Dr. Smith, from Canberra, Australia, who has done what seems to be some very nice and very interesting work in the study of the conventional cyclotron beam, conventional as far as sector cyclotrons are concerned.