

Opening Remarks

Welcome to our workshop!

I must say that I am happy and, to be honest, relieved to see that you all came, in spite of the very short notice of our announcement. I am especially grateful because this workshop depends on your participation to achieve its goals. I see many familiar faces of friends and colleagues whom I have had the pleasure of meeting earlier. For the ones I missed, my name is Robert Ruland, I am involved in the alignment effort here at SLAC.

Before we go any further into the purpose and technicalities of our meeting, let me introduce to you the director of SLAC whom we are fortunate enough to have with us this morning in order to open the meeting.

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The idea for this workshop goes back quite a few years when we started aligning the SLC. At that time, we knocked at CERN's and DESY's doors to ask for help. The original one way information street eventually evolved into a relationship where we exchanged mutual experiences and developments. One day, we noticed that we had been reinventing the wheel a number of times. Then came a time when others started knocking on our door for support and exchange of ideas. We had the same feeling again: a great deal of work had been done over again, not because of competition, but because we were always unaware what our neighbors were doing. This is the reason for initiating this workshop. We want to establish lines of communication; we want everyone to share not only their accomplishments, but also their problems. By the way, this is what the upcoming first session is all about.

But let me go somewhat beyond this.

Up to now we have been tackling the millimeter world; achieving accuracies in the order of a tenth or some tenths of millimeters. The next generation of linear colliders, however, is confronting us with the micrometer world. Microns, one thousandths of a millimeter, and we thought it was already difficult enough to achieve 0.1 mm or in microns: 100 μm accuracies. The traditional tools of our trade cannot measure to this new standard. I am tempted to compare our situation with the one Jean Gervaise at CERN and Kurt Marzahn at DESY faced roughly 30 years ago when they were asked to align the first synchrotrons at these facilities to what at that time was an unbelievably tight 0.1 mm. When we are talking about the micron world we are not talking about some distant future. The micron world has already arrived! Groups at CERN, KEK, Novosibirsk and SLAC are brainstorming linear colliders and related micron alignment techniques today. Here at SLAC, the proposed Final Focus Test Beam Project is scheduled for construction in Fiscal Year 91/92, i.e. roughly 14 months from now and will require positioning tolerances in the order of 5 μm . It is my belief that living in the micron world will require all of us pulling together, and for that matter, on the same end on the rope.

Before turning to the next session, let me say a few words about the fact that we dedicated two sessions to the fiducialization of magnets. Fiducialization is a fancy name for relating the effective magnetic axis of a component to some kind of surveying reference marks, fiducials, which can be tooling balls, CERN sockets or just some reachable mechanical feature on the component's body. The alignment process is one in which we move a component's reference mark to its called for coordinate. But this is only one part of the story. The beam does not know anything about fiducials, the beam is influenced only by the electromagnetic field of a component. We have, therefore, to relate the magnetic axis to the fiducial marks with the same care as we do the final positioning. I hope, these sessions will give an overview of some of the new approaches of making the fiducialization process more reliable and improving what is now a weak link.

But now I don't want to take any more time away from our "Get-to-meet-each-other" session. Let me trade seats now with Gerry Fischer whom I have pressed to take the chair. As a physicist, he has been involved in the construction of many machines, the latest being the SLC and is actively involved in the alignment R&D for the FFTB and NLC. He was recently on sabbatical for 6 months each at DESY and CERN working with their alignment groups where I hope he learnt something. Gerry, do something.