AUTOMATED TUNING AND FEEDBACK SYSTEMS AT THE SLC

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Abstract

A linear collider requires extensive automated tuning and feedback systems to optimize and maintain high performance. At the SLC, these systems have evolved through several generations as operational experience and a higher luminosity regime resulted in new requirements. Major breakthroughs helped the SLC achieve record luminosity in the 1997-98 run. Dispersion-free steering based on an SVD algorithm provided improved trajectories and a fast rf phasing procedure helped maintain a stable linac energy profile. A generalized optimization system facilitated emittance tuning. Many of the feedback systems used throughout the SLC to control beam trajectories, energy, etc. were upgraded and a novel optimization feedback system was used to maximize luminosity by tuning final focus parameters.