

**The Influence of Radiation Damage on the Deflection of High Energy Beams in Bent Silicon Crystals,** C. BIINO, M. CLEMENT, N. DOBLE, K. ELSENER, L. GATIGNON, P. GRAFSTRÖM, U. MIKKELSEN, CERN, Geneva; K. KIRSEBOM, S.P. MØLLER, E. UGGERHØJ, T. WORM, ISA, Aarhus - Recent results on beam deflection with bent silicon crystals show up to 50% deflection efficiency. One application of this effect, used in the NA48 CP-violation experiment at CERN, is to deflect part of a high energy proton beam away from unwanted background. However, the question of radiation damage to the crystal is a crucial one. In order to obtain the relevant information, a bent silicon crystal was (a) successfully used to deflect the SPS 450 GeV H8 microbeam, and (b) exposed during one year to a high intensity proton beam in the primary target station T6 of the SPS, i.e. irradiated by  $2.4 \cdot 10^{20}$  protons per  $\text{cm}^2$ . A contact radiography picture shows that the beam was well focused and centred on the crystal during irradiation. The results obtained for the first time with such a highly irradiated silicon crystal, when used again to deflect the 450 GeV beam, are presented in this paper. A minor reduction in deflection efficiency is observed in the irradiated region - a very encouraging result for NA48 (about 100 years of operation with the same crystal would be possible) and for future applications of bent crystals in high energy beams.