

**Slow Extraction at the Heidelberg Heavy Ion Storage Ring TSR**, F. ALBRECHT, M. GRIESER, R. VON HAHN, C.-M. KLEFFNER, R. REPNOW, D. SCHWALM and A. WOLF, Max-Planck-Institut für Kernphysik, Heidelberg; D. HABS, LMU Garching -

At the Heidelberg heavy ion cooler storage ring a slow beam extraction system using the third order resonance  $Q_x = 8/3$  been installed using the same electrostatic septum for extraction and injection. Different extraction methods have been investigated. In the first method the beam was injected close to the third integer resonance and electron cooled. By variation of the cathode potential of the electron cooler gun by -0.4% the tune was shifted to the third integer resonance due to the chromaticity of the ring. By using this method an extraction efficiency of about 30% was achieved. Beam extraction using emittance growth due to multiple scattering on the residual gas was done by setting the betatron tune just above the third order resonance ( $\Delta Q_x = 0.01$ ). The beam could also be extracted by applying a transverse rf field with a frequency corresponding to the betatron tune of the beam. By adjusting the transverse rf voltage and frequency the spill of the extracted beam and its intensity could be controlled.