

Bunchlength Measurements at AmPS with an Image Dissector Tube, J. COPPENS, G. LUIJCKX,

E. ZININ*, NIKHEF, Amsterdam, The Netherlands - The Amsterdam Pulse Stretcher (AmPS) is an electron storage and pulse stretcher ring. The ring operates at energies between 300 and 900 MeV at circulating currents up to 200 mA. Operating as a pulse stretcher a 2856 MHz travelling wave structure provides the accelerating field; when used in storage mode a 476 MHz cavity can be used instead to obtain a higher accelerating potential. For a study of the longitudinal properties of the stored electron beam a device was needed with a time resolution of the order of 10 picoseconds. For this purpose an image dissector tube was obtained from the Budker Institute of Nuclear Physics of Novosibirsk. The set-up has been commissioned September 1995. The 2856 MHz accelerating structure and a low energy of 380 MeV were used to get bunchlengths of 10 ps. With these short bunches it was possible to analyse the time resolution of the set-up. The impulse response is approximately Gaussian with a α -value of 20 ps. Bunchlength measurements with 476 MHz RF showed coupled bunch instabilities. Bunchlength is presently measured as function of beam current. Once the problems with coupled bunch instabilities have been solved this measurement will be used to determine the broadband impedance of AmPS.

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