

Experimental Observation of the Longitudinal Phase Space Distribution in a Storage-Ring: Influence of the Beam Current and the Compaction Factor, R.J. BAKKER, M.E. COUPRIE, L. NAHOND.

NUTARELLI, R. ROUX; SPAM/LURE,
M. BILLARDON ESPCI, A. DELBOULBÉ,
D. GARZELLA, A. NADJI; LURE, B. VISENTIN;
LNS - The storage ring Super ACO at Orsay, France offers a large agility as regards the value of the compaction factor (α), i.e., under special conditions α can be set to either positive, negative or very small values. This aspect can be important for the development of new storage-ring based light-sources where a high electron-density is advantageous, e.g., short-pulse synchrotron sources or storage ring based free-electron lasers (SRFEL). Recently, the influence of α on the micro-bunch length and the energy-dispersion has been investigated experimentally. E.g., the micro-bunch length was measured with a double-sweep streak-camera and a dissector, while the energy-spread was deduced from the properties of the spontaneous-emission spectrum emerging from a set of two undulators, i.e., an optical klystron. Here the diagnostic, developed and installed for the Super ACO SRFEL, will be described and discussed in detail. Results, regarding the influence of the average beam current and α on the bunch-length and energy dispersion will be discussed.