

**Envelope Description of Quasi-Laminar Beams
undergoing Reversible Emittance Transformations,**

J.B. ROSENZWEIG, Dept. of Physics and Astronomy,
UCLA, Los Angeles, L. SERAFINI, INFN, Milano - A
fully analytical description of the envelope behaviour
for intense, space charge dominated beams which are
relativistic and quasi-laminar, is presented. It is based
on a particular solution of the envelope equation which
is invariant under reversible emittance transformations,
the so-called invariant envelope. The treatment is
applicable both to bunched beams in drifts and in
linacs, whenever the beam is space charge dominated.
The main interest is in maximizing the beam brightness
achievable by Photo-Injectors and preserving the beam
quality during the first stages of acceleration. Simple
analytical formulae and operating diagrams are
provided to predict the performances of these devices,
when they are operated in the space charge emittance
correction regime.