

## CENTER FOR BEAM PHYSICS SEMINAR

# “Beam Dynamics of Non-Equipartitioned Beams in the Case of the Superconducting H-Linac Project at CERN”

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Friday, June 15<sup>th</sup>, 2001, 10:30 AM  
Bldg. 71 Albert Ghiorso Conference Room, LBNL

### Summary:

The Superconducting H<sup>-</sup> Linac (SPL) working group at CERN is studying a 2.2 GeV H<sup>-</sup> linac, which recuperates a large amount of RF hardware from the now decommissioned LEP at CERN. During the ongoing design effort for an optimized layout, it was found that in some cases non-equipartitioned beams tend to exchange energy between the longitudinal and the transverse planes. Strict energy equipartition, however, imposes tight restrictions on such a high energy linac and often contradicts the goal of cost effective design. On the other hand, stability charts derived from 2D Vlasov analysis suggest the existence of stable non-equipartitioned equilibria in certain regions of parameter space. Due to the low bunch current (22mA) in the SPL, these regions are large enough to ensure stable machine operation for non-equipartitioned beams. Systematic multiparticle simulations with IMPACT [1] are used to apply the stability charts to the beam dynamics design of a realistic high energy linac. Using the example of the SPL, it is shown that designs with stable non-equipartitioned bunches are feasible, and how these designs react to mismatched input beams.

### Brief Biography:

Frank Gerigk is currently in the RF group of the PS division at CERN, completing his PhD. Prior to this affiliation he began his studies Berlin Technical University.

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