

Cavity Loss Factors for Non-Relativistic Beams,
S.S. KURENNOY, LANL - Cavity loss factors can be easily computed for a relativistic beam using time-domain codes like MAFIA or ABCI. However, for the beam velocity v significantly smaller than the speed of light c the problem is more complicated because of difficulties with the formulation of boundary conditions in the time domain. We study the loss factors for a non-relativistic bunch versus the bunch velocity, and compare results with the relativistic case. While for very low velocities the loss factor of any individual mode decreases exponentially, it can exhibit strong oscillations when v is comparable to c , and can exceed its relativistic value many times. An obvious implication is that one should exercise caution in using relativistic results as estimates of HOM heating in superconducting machines with high-current non-relativistic beams.