

Beam Dynamics in a Proposed 350 MHz SC Linac for Waste Transmutation and Energy Production, G. BELLOMO, P. PIERINI, INFN MILANO - LASA, Via Fratelli Cervi, 201 I-20090 Segrate (MI) Italy - A 100-1600 MeV, 25 mA, superconducting proton linac is under study by INFN for Waste Transmutation and Energy Production [1]. The linac is composed of three sections with elliptical five cell superconducting RF cavities (350 MHz) designed for synchronous beta of 0.5, 0.65 and 0.85. Transverse focusing is provided by a doublet lattice. The linear beam dynamics in the sections has been studied, and a smooth matching between the sections has been devised, up to a beam current of 50 mA. Due to the wide bore of the 350 MHz cavities, the ratio of the linac aperture to the rms beam radius is greater than 25 along the linac, to reduce activation by halo losses. The layout of the linac has been then analyzed with non linear simulations, that include RF and space charge effects. The results from the linear and non linear analysis are summarized in this paper, together with a description of the proposed lattice parameters.

- [1] C. Pagani, G. Bellomo, P. Pierini, in Proceedings of the XVIII Int. Linear Acc. Conf., Editors C. Hill and M. Vretenar, CERN 96-07 (1996), p. 107.