

Tank, Cell and Bridge Coupler Design for the CCL of the ESS Project, J.I.M. BOTMAN, R.W. DE LEEUW, M.J. VAN DE SANDE, C.H.Ph. WASSINK, Cyclotron Laboratory, Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven, The Netherlands - The design of the tanks, cells and bridge couplers of the 700 MHz 70 - 1334 MeV H^- side coupled cavity linac of the European Spallation Source project is presented. As a cost effective solution 66 4 MW klystrons will power 4 tanks each. The 4 tanks will be connected by 3 bridge couplers. The klystron is attached to the middle bridge coupler. Each tank contains 16 (70 MeV) - 10 (1334 MeV) accelerating cells. The coupling coefficient between accelerating and coupling cells is varied along the linac and is minimised for each set of 4 tanks under the constraint that the field levels within each set of 4 tanks are kept constant within 1%. The bridge couplers that span gaps of $3/2\beta\lambda$ are $2\beta\lambda$ long. In order to expel the TE_{111} and TE_{112} mode in the bridge couplers from the passband in the tanks, the TE_{111} is shifted away by capacitively loading the coupler with end stubs. The TE_{112} mode is expelled by usage of two rings where the field strengths are maximal. The thus obtained bridge coupler still operates as a single cell resonator.