Three Dimensional Design of the Bending Magnets for a 1.5 GeV-Double Sided Microtron*, H. EUTENEUER, K.-H. KAISER, H.-J. KREIDEL, U. LUDWIG-MERTIN, S. RATSCHOW, Univ. Mainz - A Double Sided Microtron (DSM) is planned to upgrade the three staged cw racetrack microtron cascade MAMI [1] from 855 MeV to 1500 MeV. The DSM consists of two rf accelerator sections connected to each other by identical achromatic 180 deg.-bending systems. Each of these consists of a symmetric pair of 90 deg.-segment magnets with a common entrance and exit pole edge. While the horizontal optics of the bending system corresponds to a simple (energy dependent) drift length, the vertical motion is more complicated due to the 45 deg. pole face inclinations at both the beam entrance and exit. In our design the vertical defocussing resulting from this is compensated in the whole energy range by an appropriate field gradient normal to the pole edge. In the paper the design of the segment magnets with respect to optimum field distribution and minimum iron consumption is given. In order to achieve the required field accuracy of 0.01%, surface correction coils were simulated, consisting of thin current sheets in the air gap close to the pole surfaces. The calculations were done with TOSCA.

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[1] H. Herminghaus, Proc. LINAC'88, p.247.