

Normal Conducting QM Quadrupole for the HERA Luminosity Upgrade, N. BOGATOV, E. BONDARCHUK, N. DOINIKOV, B. KITAEV, V. KORSHAKOV, N. KOZHUKHOVSKAJA, V. KRASNOPEROV, V. LOKIEV, N. MAXIMENKOVA, V. MURATOV, A. PETROV, EFREMOV INSTITUTE; B. PARKER, BNL; K. SINRAM, F. WILLEKE, G. WOEBKE, DESY - Design and properties for the septum half-quadrupole QM for the HERA luminosity upgrade are discussed. The magnet is 3.4 m long; it has a gradient of 25 T/m with a pole radius of 37 mm. The field error must be limited to $3E-4$ at 25 mm reference radius over the whole excitation range of $G_{max} = 20 * G_{min}$. The septum is the vertical mirror plate of the half quadrupole. The thickness of the plate (70 mm) is reduced near the origin by a cut-out providing a septum of only 15 mm thickness. This way a field free space with $B < 20$ gauss for a second beam is provided very close to the high gradient region. The optimization of the field quality and the detailed design featuring pole shaping and shim coils of this challenging magnet are described.