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Electrical and Mechanical Design of Electrodes and RF System for a Multipole Plasma Trap[1] MAX ZAKI, HENRIQUE MILLER, ISAAC HAMLIN, ZOEY BIGELOW, MATTHEW ISADA, NATHANIEL HICKS, University of Alaska Anchorage — A mechanical design of copper electrodes and in-vacuum structure for a 32-pole spherical multipole plasma trap of radius 25-cm is presented. The trap will be installed in a cylindrical stainless steel ultrahigh vacuum chamber at the UAA Plasma Lab, and it can be located along the cylindrical axis for optimization with respect to ports and diagnostic sight lines, as well as plasma and beam sources outside the trap that will load it with particles. The electrical connections, RF power feedthroughs, and external RF hardware needed to drive the trap at frequencies from 10-250 MHz, and RF voltages from 100-1250 V will be illustrated as well. Computer modeling of the RF electrical environment is conducted, and performance of the trap over the desired frequency and voltage range is predicted and discussed.

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Nathaniel Hicks
University of Alaska Anchorage

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