

## **Orbit theory study of electron confinement in a Polywell device**

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An orbital theory model was applied to a six faced polyhedral cusp trap known as a Polywell device. This method allowed for simulation and analysis of a large parameter space of radius, current, initial energy of the electrons and rate of change of coil current. To span this large parameter space, orders of magnitude increments were employed. Power loss densities were derived due to maintaining the virtual cathode. Comparisons with simulated results and theoretical derivations for confinement time of electrons and their average radius from the center has been conducted. Excellent agreement was found with confinement time results and a fitted equation was obtained for the average radial position of electrons for the parameter space spanned.