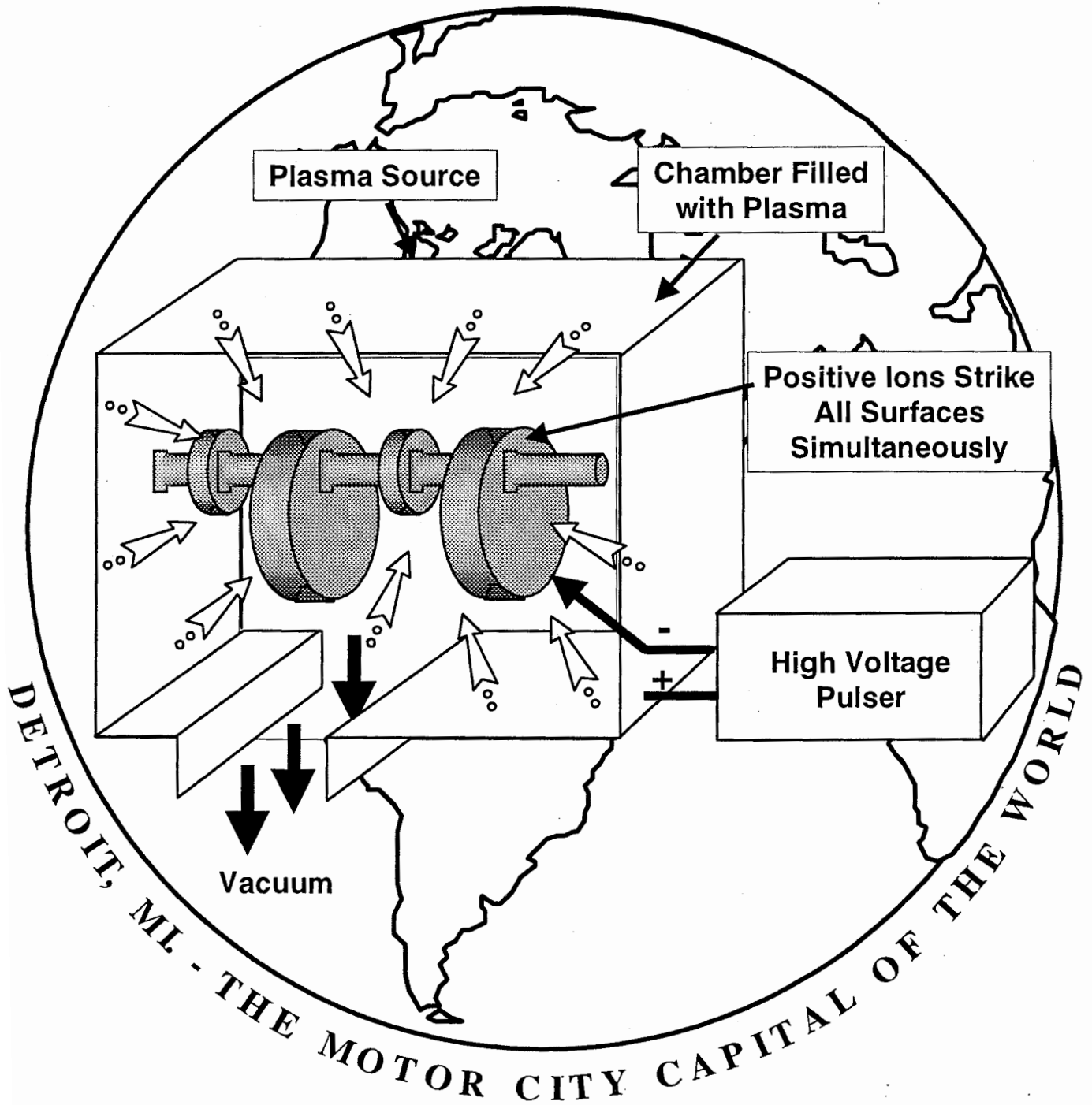


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## SIMULATION OF INNER SURFACE PLASMA IMMERSION ION IMPLANTATION

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Plasma immersion ion implantation (PIII), unrestrained by the line-of-sight limitation, is suitable for inner surface modification. Previous simulation work using a one-dimensional fluid model shows that the impact energy and retained dose are quite low. In order to analyze the sheath expansion as well as velocity and density evolution more accurately, a two-dimensional cylindrical coordinate fluid model has been developed for inner surface PIII. Our simulation results predict a strong bi-directional flux from ions outside of the bore after the sheath overlaps inside the bore. This phenomenon has been experimentally verified in our preliminary work but has never been revealed by the one-dimensional model. The existence of this axial high-energy ion flux enhances the impact energy and retained dose.