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A two dimensional circuit model of induction cavity

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Induction voltage adder accelerators are always employed to achieve high voltage and fast rise time voltage pulse for various research aims. The voltage pulses generated by pulse forming section are added by induction cell. Azimuthal transmission line is used to ensure current uniformity at secondary transmission line section. This results in two dimensional power flow in the induction cell. A circuit model of induction cavity has been proposed to investigate the power flow condition in induction cell. One dimensional and two dimensional transmission line elements are included which can model the radial and azimuthal directions power flow inward azimuthal transmission line and axial and azimuthal directions power flow at secondary transmission line section by this circuit model. Transient electromagnetic simulation has been employed to check out the exactness of the circuit model. The voltage waveforms at oil elbow, insulator stack, radial feed gap, secondary transmission line and dummy load acquired by the two different methods can agree with each other very well.

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