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Preliminary pulsed power design of an induction injector for radiographic applications.

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In order to be able to propose a dual pulse accelerator for future flash X-rays capabilities, a preliminary design of a high current induction injector has been developed. This design is based on the use of dual pulsed power generators actually available in the lab. The architecture, the number of cells needed and the dimensions of the conductors are evaluated with the hypothesis of using large METGLAS magnetic core similar to those used on RITS-6 IVA machine and breakdown probability in the insulating oil. The dynamical behavior of the magnetic material under two pulses excitation is analyzed with a non-linear magnetic diffusion model. The choice of the impedance coupling between the generators and cells is based on the flat top requirement on the output energy of the electron beam. Additionally, the results of global spice simulations are illustrated.

Authors: BIZOT, Marc (CEA (FR)); Dr CASSANY, Bruno (CEA (FR)); Dr COURTOIS, Laurent (CEA (FR))

Presenter: Dr CASSANY, Bruno (CEA (FR))

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