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NDCX-II injector with a 10.9-cm diameter Li⁺ ion source

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The Neutralized Drift Compression Experiment II (NDCX-II) is an accelerator facility for warm dense matter studies. It will generate a short Li⁺ ion beam pulse (~ 1 ns) at up to a few MeV ion kinetic energy to uniformly heat thin targets to ~ 1 eV temperature. The NDCX-II induction linac has a 130-kV injector that produces ~ 100 -mA, 0.5- μ s ion current from a 10.9-cm diameter lithium alumino-silicate ion source. The fabrication and operation of the ion source is challenging due to the high current density required, the difficulty in coating the large emitter and the high operating temperature of 1275°C. Required power to heat the source is 3.4 kW and calculated temperature variation across the surface is 9.8°C. Details of the NDCX-II injector design and initial beam optics will be presented.

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