

# Obtaining high-temperature plasma by two field-reversed configuration colliding

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The formation, acceleration and collision of field-reversed configuration (FRC)—compact tori—is becoming a popular field in plasma physics, attracting hundreds of millions of dollars, including private investment. The main advantage of FRC is the possibility of its acceleration and compression by an external magnetic field for use in inertial nuclear fusion, as well as in electric rocket thruster or for collective ion acceleration. Accelerated to hundreds of kilometers per second, tori with the same direction of current are attracted, their magnetic fields are reconnected, and all the kinetic energy of the tori goes into heating the plasma, accompanied by a sharp burst of radiation include soft x-ray. The Rosatom program “Development of equipment, technologies and scientific research in the field of use of atomic energy in the Russian Federation” (RTTN; 33.375 billion rubles) provides for the construction of a second plasma accelerator at the TRINITY to create a collider of two plasmoids (FRC). Work is also carried out at the LPI RAS together with Know How Ltd. The new method for forming compact tori in inductive energy storage devices was proposed and patented [1]. This method showed high efficiency in converting the magnetic energy of the storage device—up to 70% of the stored energy is transferred to the FRC, the current reached several tens of kiloamperes with a compact tori diameter of 30 cm, and its speed was 40 km/s [2].

- [1] Romadanov I V, Ryzhkov S V and Mozgovoy A G 2014 Method of forming a compact plasmoid *Patent* RU 2523427
- [2] Mozgovoy A 2022 FRC collider *Proc. of 8<sup>th</sup> Int. Congr. on Energy Fluxes and Radiation Effects* (Tomsk, Russia) pp 160–165