Canadian Association of Physicists | Association canadienne des physiciens et physiciennes

Contribution ID: **1846** Type: **Invited Speaker / Conférencier invité**

Tokamak compression experiments at General Fusion

Tuesday, 30 May 2017 11:30 (30 minutes)

General Fusion (GF) is a private company developing fusion energy with the ultimate goal of building a fusion power plant. We are using a novel technique called Magnetized Target Fusion (MTF), first proposed by the US Naval Research Lab in the 1970's. In MTF, one first creates a magnetically confined moderately warm plasma of around 100 eV in a flux conserver. The flux conserver is then rapidly compressed. The magnetic field cannot penetrate the flux conserver on the time scale of the implosion. Magnetic field and plasma are compressed to the high temperature, magnetic field and pressure required for a fast fusion burn (microseconds).
General Fusion's Magnetized Target Fusion system uses a ~3m sphere filled with molten lead-lithium that is pumped to form a cavity. A pulse of magnetically-confined plasma fuel is then injected into the cavity. Around the sphere, an array of pistons drive a pressure wave into the centre of the sphere, compressing the plasma to fusion conditions. This process is then repeated, while the fusion neutrons from the reaction are captured in the liquid metal and used to generate electricity via a steam turbine. A standard heat exchanger-steam turbine produces electric power, and some of the steam is recycled to run the pistons.
Initial plasmas with performance sufficient to do compression experiments have been developed. Because of the size and capital cost of building a large-scale piston driven compression system, plasma compression experiments presently form these plasmas in an aluminum flux conserver that is rapidly compressed using a chemical driver. The results of these experiments will be presented.

Primary author: Mr DELAGE, Michel (General Fusion Inc.)

Presenter: Mr DELAGE, Michel (General Fusion Inc.)

Session Classification: T2-5 Tokamak Experiments: Transmission Highlights in Communications (DIMP/DIAP) | Expériences Tokamak: repères de transmission dans les communications (DPIM/DPIA)

Track Classification: Industrial and Applied Physics / Physique industrielle et appliquée (DIAP-DPIA)