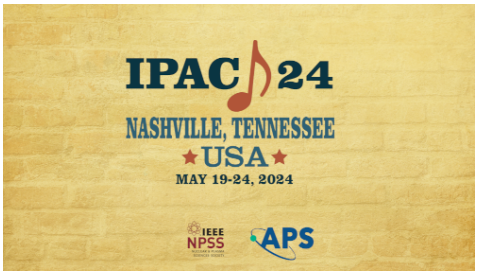

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Accelerator-driven fusion

Tuesday 21 May 2024 14:20 (20 minutes)

TAE Technologies (TAE) is a privately funded company pursuing a novel approach to magnetic confinement fusion, which relies on Field-Reversed Configuration (FRC) plasmas stabilized and sustained with high power Neutral Beam Injection (NBI). This advanced FRC-based system simplifies reactor design and could offer a path forward to economical aneutronic fusion.
To validate the science behind the approach, an experimental program is underway at TAE's state-of-the-art research facility, which houses the world's largest FRC device, Norman. In Norman, 20 MW of variable energy NBI, coupled with edge biasing, active plasma control, and advanced surface conditioning, has led to the production of steady-state FRC plasmas dominated by fast ion pressure and characterized by macroscopic stability and reduced transport [,*].
Our quest towards a practical FRC-based fusion reactor has stimulated innovation across a wide range of technologies. In particular, numerous innovations in negative ion beams and high-energy accelerators, which were originally introduced to serve current and future fusion experiments, have been combined to create an advanced commercial accelerator for targeted cancer radiation therapy.
In this talk we will present an overview of TAE's approach to fusion and describe a few examples of accelerator innovation and their commercial application.

Footnotes

- H. Gota et al., Nucl. Fusion 59, 112009 (2019) ** M. Binderbauer et al., Phys Plasmas 22, 056110 (2015)

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