



Measurement of Magnetic Field using Doppler-Free Saturation Spectroscopy (DFSS) in C-2W FRC plasma

Topic Area:
Diagnostics

Partner		Company	
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Project Summary:

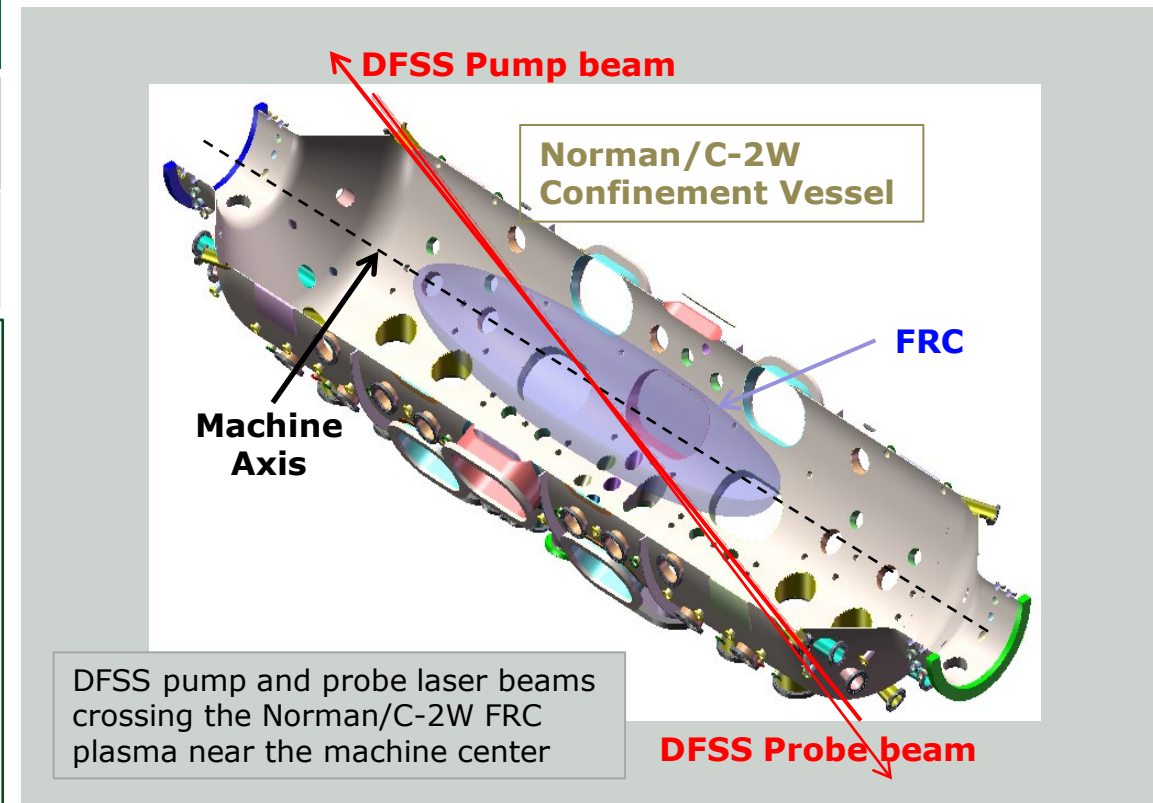
The portable DFSS diagnostic (developed by ORNL under the ARPA-E BETHE program) was deployed in TAE's Norman/C-2W device to non-intrusively measure low magnetic field and its direction in the core of the FRC plasma.

Fusion Impact:

Diagnostics, like DFSS, which depend upon the neutrals in the core of a fusion-relevant plasma are challenging due to low SNR. In the Norman/C-2W device, the charge exchange of neutral beams does not provide sufficient warm neutrals or SNR for DFSS diagnostics. The INFUSE award helped to narrow down the techniques and critical parameters to consider for measuring the low magnetic field in a fusion-relevant FRC core.

Business/Market Impact:

Allowed TAE to explore new diagnostics tools to measure low magnetic field. Saved the cost and time required to develop and master the DFSS diagnostic. Helped narrow down options of possible diagnostics for internal magnetic field measurements.



Period of Performance:	Federal Share:	Cost Share:
2021-23 (INFUSE 2020b)	\$165k	\$110k