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6.13 A combined mmwave and CO2 interferometer on the C-2W Jet plasma

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The C-2W device at TAE Technologies is now operational and represents another major step in a progression of advanced beam-driven Field-Reversed Configuration (FRC) confinement devices that have prolonged the lifetime, increased the stability and have added significant neutral beam injection power to heat and sustain an FRC plasma. Crucial to plasma sustainment and increased lifetime is an understanding of the Jet plasma and X-point dynamics. A novel two-color multi-chord tangentially viewing interferometer has been designed and built to provide line averaged density at both 10.6 mm mid-infra-red and 1000 mm millimeter-wave wavelengths. This combination of sources allows a generous measurement dynamic range. The Jet interferometer is positioned in the mirror region of the confinement vessel (CV) to capture the initial high-density translated FRC source, the establishment of the Jet outflow from the merging of the two FRCs in the CV and the steady-state Jet plasma for the duration of the discharge which is expected to be of low line averaged density. An array of four tangential chords is anticipated to allow some profile reconstruction. Discussion of the performance and data will be presented.

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