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Design of a new X-mode edge reflectometer for Alcator C-mod[1]
CORNWALL LAU, MIT Plasma Science and Fusion Center, GREG HANSON, JOHN WILGEN, Oak Ridge National Laboratory, YIJUN LIN, STEVE WUKITCH, MIT Plasma Science and Fusion Center — The study of antenna-plasma interactions during RF heating and current drive often requires high temporal and spatial resolution density profiles of the SOL in front of the ICRF antenna. A new swept-frequency X-mode reflectometer is being built for Alcator C-mod to measure the edge density profiles in front of the future E port antenna. Due to the presence of strong ICRF heating and large density fluctuations, density profile measurements are difficult. This reflectometer is thus designed to use both differential-phase and full-phase reflectometry techniques to allow for the best results to be obtained. The system is planned to operate between 100 and 145 GHz at sweep rates from 10 μs to 1 ms and will cover a density range of approximately 10^{16} to 10^{20} cm^{-3} at 5-5.4 T. Design of this new reflectometer and initial results from modeling and testing will be presented.

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