

USE OF NEAR-INFRARED DETECTOR TO SENSE RF ANTENNA HEATING*

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The three antennas used for ion cyclotron heating (ICH) experiments on DIII-D have experienced localized heating during plasma operations which resulted in melting of the antenna structure. This melting is of great concern not only because of the damage it does to the rf system's ability to deliver rf to the plasma, but because of its potential to poison the plasma during a shot and cast the experimental results from the shot into question.

A real-time sensor to detect the temperature of the antennae during plasma operations is described. The sensor uses an avalanche photo diode (APD) with sensitivity from 0.6 to 1.0 μm to monitor the temperature of the antennae. Calculations for the detector sensitivity based on Planck's law are compared with experimental results and detector data taken during plasma operations are presented.

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