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Category Number and Subject: 6.20 DIII-D Tokamak

Theory     Experiment

**Plasma Imaging of the DIII-D Tokamak\*** S.L. Allen, C.J. Lasnier, W.H. Meyer, *LLNL*; J. Howard, *ANU*; A.R. Briesemeister, *ORNL* — The LLNL IR/visible periscope views the entire DIII-D plasma cross section and a new beamsplitter enables simultaneous measurements with IR and visible cameras. In the lower divertor, a Coherence Imaging System (CIS) measures the 2-D flow of CIII ions with  $\sim 1$  ms time resolution. Visible color movies obtained during Li dropper operations,  $N_2$  puffing, and  $D_2$  puffing provide insight into SOL flows; trends are seen with the direction of the toroidal field. Localized changes in recycling are compared with changes in heat flux. A second CIS is being installed to measure impurity ion flow on the periscope. The lower divertor CIS system has been upgraded to include a new in-situ calibration system and temperature control, which has significantly increased the quality of the flow measurements. Rapid inversion of the coherence phase shift data maps the toroidal plasma flow to magnetic flux surfaces. The CIS carbon flow measurements are compared with conventional spectroscopy and Mach probe measurements of the main ion flow.

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