Abstract Submitted
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Status of US ITER Diagnostics[1] B. STRATTON, L. DELGADO-APARICIO, K. HILL, D. JOHNSON, N. PABLANT, PPPL, R. BARNSLEY, G. BERTSCHINGER, M.F.M. DE BOCK, R. REICHLE, V.S. UDINTSEV, C. WATTS, IO, M. AUSTIN, P. PHILLIPS, UT-Austin, P. BEIERSDORFER, LLNL, T.M. BIEWER, G. HANSON, C.C. KLEPPER, ORNL, T. CARLSTROM, M.A. VAN ZEELAND, GA, D. BROWER, E. DOYLE, A. PEEBLES, UCLA, R. ELLIS, U. Md., F. LEVINTON, H. YUH, Nova Photonics — The US is providing 7 diagnostics to ITER: the Upper Visible/IR cameras, the Low Field Side Reflectometer, the Motional Stark Effect diagnostic, the Electron Cyclotron Emission diagnostic, the Toroidal Interferometer/Polarimeter, the Core Imaging X-Ray Spectrometer, and the Diagnostic Residual Gas Analyzer. The front-end components of these systems must operate with high reliability in conditions of long pulse operation, high neutron and gamma fluxes, very high neutron fluence, significant neutron heating (up to 7 MW/m^3), large radiant and charge exchange heat flux ($0.35MW/m^2$), and high electromagnetic loads. Opportunities for repair and maintenance of these components will be limited. These conditions lead to significant challenges for the design of the diagnostics. Space constraints, provision of adequate radiation shielding, and development of repair and maintenance strategies are challenges for diagnostic integration into the port plugs that also affect diagnostic design. The current status of design of the US ITER diagnostics is presented and R&D needs are identified.

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