Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Finding the magnetic field structure of a snowflake divertor from a limited set of the input parameters D.D. RYUTOV, V.A. SOUKHANOVSKII, LLNL — One of the steps in developing the control systems for magnetic divertors is a quick reconstruction of their magnetic topology from a limited set of the input parameters. Normally used as these input parameters are the poloidal field (PF) components at several spatial points. These PF data can be obtained from the magnetic equilibrium code output or (conceptually) from the direct PF measurements. In the case of a snowflake (SF) divertor with its two nearby nulls, the field structure is characterized by the presence of multiple separatrices that complicates the reconstruction process. We describe a technique that makes possible an unambiguous identification of the configuration, in particular, distinguishing between SF-plus vs. SF-minus configurations. The technique is based on the consistent use of a complex representation of the poloidal field, and its description in terms of a flux function and scalar potential. The disambiguation of topological features of the magnetic configuration is based on the information on the direction of the plasma current. Several examples of the application of this technique to specific configurations of the SF family are presented. Work performed for U.S. DOE by LLNL under Contract DE-AC52-07NA27344; supported by the U.S. DOE OFES..

D.D. Ryutov
LLNL

Date submitted: 14 Jul 2016 Electronic form version 1.4