Heat flux management via advanced magnetic divertor configurations and divertor detachment


Princeton Plasma Physics Laboratory, Princeton, New Jersey 08543, USA
Lawrence Livermore National Laboratory, Livermore, California 94550, USA
General Atomics, PO Box 85608, San Diego, California 92186-5608 USA
Oak Ridge National Laboratory, PO Box 2008, Oak Ridge, Tennessee 37831 USA

Abstract. The Snowflake Divertor (SD) control and detachment control to manage the heat flux at the divertor are successfully demonstrated at DIII-D. Results of the development and implementation of these two heat flux reduction control methods are presented. The SD control algorithm calculates the position of the two null-points in real-time and controls shaping coil currents to achieve and stabilize various snowflake configurations. Detachment control stabilizes the detachment front fixed at specified distance between the strike point and the X-point throughout the shot.