

## THE DESIGN AND APPLICATION OF THE MOVABLE LIMITER IN EAST

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### Abstract

Two movable limiters have been designed and built for EAST. The movable limiter system consists of three parts that are blade components, transfer components and drive components. The head which made of cop and covered with SiC coated graphite tiles has to face plasma during electrical discharge. The transfer components consist of a long shaft and a movable plate. The drive components consists of a screw shaft, a step motor, four guide shafts and two support plates. There is an extra support which has fit in Tokamak and a frame on the outside of the flange. The specific shape of the blade is two lines and a curve of fit to meet the plasma shape. And the shape of the graphite tiles on the blade of the limiter has been also carefully designed to bear max 5MW/m<sup>2</sup> heat load. The blade has two long cooling channels to remove the heat power on the graphite tiles. The long shaft of the transfer components connect with blade to make it can move along the axis of the limiter. So the blade moments allow experiments to be conducted with a wide variety of plasma major and minor diameters. The drive components provide motion from step motor which can be remote controlled in the control room far away from the scene. The rotation is translated to slide motion by a screw shaft. The screw shaft can push the slide which connected with the long shaft to at last move the blade. To introduce the motion from outside to the vacuum vessel, the limiter has a long bellow and special structure as dynamical seal. This seal structure proved very simple and reliability so it can be easily fabrication. The remote control system has been also equipped the distance sensor to provide the information of the position of the limiter. The control system is based on PC so it can be easily operated. The two movable limiters have been installed on the EAST. During past twice discharges, the movable limiter proved to be a useful tool for EAST to control the limiting physical boundary.

Key words: movable limiter, heat load, remote control