

Abstract Submitted  
for the DPP14 Meeting of  
The American Physical Society

**The observation of Synchronous Oscillation prior to Disruption in the HL-2A tokamak** DI HU, Peking University, School of Physics, M.JIANG TEAM, X.C.WANG TEAM, Z.B.SHI TEAM, Y.B.DONG TEAM, X.Q.JI TEAM — An evident class of MHD activities before disruption has been observed during the density limit induced disruptions of the HL-2A tokamak discharge. It is named “SOD,” the Synchronous Oscillations prior to Disruption, which is characterized by the synchronous oscillations between ECE signal, the core SXR signal, Mirnov signal, and H line radiation crossing the divertor region. It is observed in the parameter regime which typically corresponds to radiation-induced disruptions. It is also found that during SODs, most of the plasma current is enclosed within the  $q=2$  surface, making the resistive kink mode unstable. It has been found that the 2/1 mode and its higher order harmonics are dominant during SODs, and it is the decrease of mode frequency and the final mode locking that leads to the disruptions. The electron temperature perturbation structure shows that plasma is dominant by resistive-kink with gradual phase shift in the core plasma region and a single island in the cool, highly resistive boundary layer. There is little indication of the existence of multi-helicities islands prior to the disruption. This suggests that it is the non-linear growth of this 2/1 kink and its higher order harmonics, rather than the overlapping of multiple islands, ultimately triggered disruption.

Leonid Zakharov  
Princeton University, PPPL

Date submitted: 16 Jul 2014

Electronic form version 1.4