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Theory Experiment

Off-Axis-Fishbone Mode and Its Relevancy to the RWM Onsets,* M. Okabayashi, *PPPL*; W.W. Heidbrink, *UC-Irvine*; Y. In, *FAR-TECH, Inc.*; G. Matsunaga, M. Takechi, *JAEA*; E.J. Strait, G.L. Jackson, R.J. La Haye, P.E. Sieck, *GA*; M.J. Lanctot, *LLNL*; J.M. Hanson, *Columbia U* – In neutral beam injection heated plasmas with beta above the no-wall limit of the external kink and central safety factor $q(0) > 1$, bursting off-axis fishbone modes (OFM) are often observed to trigger the resistive wall mode (RWM) in DIII-D. One of the relevant features of the OFM is the mode distortion in time on magnetics and ECE, as the mode amplitude increases. The distortion is peaked with the maximum mode amplitude. The mode then decays faster than the initial mode growth rate, which is not seen in classical fishbone modes. Based on the poloidal mode structure, a hypothesis is proposed that the distortion is related to the stable branch of external kink mode and the sinusoidal component is EP-driven branch. The relevancy to the RWM onset will be discussed from the view point of RWM avoidance and suppression..

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