Properties of Reversed Shear Alfvén Eigenmodes in Ideal MHD

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A theory of Reversed Shear Alfvén Eigenmodes (RSAEs) is developed for negative magnetic shear plasmas with q_{min} above or at rational values. At such q_{min} RSAEs are known as having their frequency sweeping down or bottoming, respectively, as q profile relaxes (decreases) in time. The eigenmode equation formulation is performed in the low beta high aspect ratio plasma and is based on previous works [1, 2]. Its analytical and numerical solutions are compared with the more complete ideal MHD code NOVA simulations. Properties of down sweeping and sweep bottom RSAEs and their implications for the plasma diagnostics are discussed and compare with the properties of the sweeping up RSAEs.

^[1] G. Y. Fu and H. L. Berk, Phys. Plasmas 13, 052502 (2006).

^[2] N. Gorelenkov, G. Kramer, and R. Nazikian, Plasma Phys. Control. Fusion 48, 1255 (2006).