Global Alfvén Eigenmodes in the RFX-mod reversed-field pinch plasma

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High frequency magnetic activity is detected at the edge of the RFX-mod reversed-field pinch (RFP) experiment. The analysis is performed by means of an insertable edge probe, equipped with a matrix of electrostatic and magnetic probes.

The measured poloidal magnetic field shows a coherent activity superimposed to a smooth background, consisting in two distinct peaks at frequencies in the range 0.1÷1.5 MHz. In the spectrum, the position of the peaks is found to be tightly depending on the Alfvén velocity, v_A. In particular, by a deeper analysis performed at different plasma current and density levels, and using discharges with different working gases, a linear relation between the two modes frequencies and v_A, in the form $\omega = k_{//} v_A$, is found. Therefore, the dispersion relation permits to calculate the two values of the wave vector component parallel to the magnetic field, $k_{//}$. This observation suggests that the two modes are Alfvén Eigenmodes.

Further experimental observations, in close agreement with what described by L. Villard *et al.* (1997) [1], entail the interpretation of the modes in terms of n = 0 Global Alfvén Eigenmodes. In particular, it has been observed that the lower mode frequency is about 75% of the larger one, as described in the above-mentioned paper. Finally, an estimation of the toroidal mode number is performed using two poloidal magnetic probes closely spaced in the toroidal direction: *n* values centered on zero are found; this result is consistent with the n = 0 GAEs interpretation.

[1] L. Villard, J. Vaclavik, *Nuclear Fusion*, **37**, 351 (1997)