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Error Field Assessment from Driven Mode Rotation: Results from Extrap-T2R Reversed-Field-Pinch and Perspectives for ITER F.A. VOLPE, Columbia University, New York, NY, USA, L. FRASSINETTI, P.R. BRUNSELL, J.R. DRAKE, K.E.J. OLOFSSON, Royal Institute of Technology (KTH), Stockholm, Sweden — A new ITER-relevant non-disruptive error field (EF) assessment technique not restricted to low density and thus low beta was demonstrated at the Extrap-T2R reversed field pinch. Resistive Wall Modes (RWMs) were generated and their rotation sustained by rotating magnetic perturbations. In particular, stable modes of toroidal mode number n=8 and 10 and unstable modes of n=1 were used in this experiment. Due to finite EFs, and in spite of the applied perturbations rotating uniformly and having constant amplitude, the RWMs were observed to rotate non-uniformly and be modulated in amplitude (in the case of unstable modes, the observed oscillation was superimposed to the mode growth). This behavior was used to infer the amplitude and toroidal phase of n=1, 8 and 10 EFs. The method was first tested against known, deliberately applied EFs, and then against actual intrinsic EFs. Applying equal and opposite corrections resulted in longer discharges and more uniform mode rotation, indicating good EF compensation. The results agree with a simple theoretical model. Extensions to tearing modes, to the non-uniform plasma response to rotating perturbations, and to tokamaks, including ITER, will be discussed.

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