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FPIC Study of the n=1 Toroidal Mode in FRC Plasmas FRANCESCO CECCHERINI, SEAN DETTRICK , DAN BARNES , LAURA GALEOTTI, TriAlpha Energy, Rancho Santa Margarita, TAE TEAM — The near term goal of TAE's experiments is to sustain through the of use of neutral beam heating and edge biasing an advanced beam-driven FRC for many milliseconds, i.e., well beyond the growth times of common instabilities. Here we apply FPIC, a quasineutral hybrid code with fully kinetic ions, to study the growth rate of the n=1 mode and related kinetic effects versus different equilibrium parameters in configurations of interest for upcoming TAE's experiments. In particular we address how the n=1 growth rate scales versus S*/E and E. The mode strength is computed taking into account a full 3D mode decomposition of the FRC separating the physically distinct contributions, namely tilt, radial shift and interchange modes and we study the role of each one of them.

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