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Overview of C-2 Field Reversed Configuration Experiments HOUYANG GUO, Tri Alpha Energy, Inc., TAE TEAM — The C-2 compact toroid merging (CT) facility [1] was built to form and sustain high temperature Field Reversed Configurations (FRC) with extremely high beta (i.e., with the ratio of confined plasma to external total magnetic pressure approaching 100%). Significant progress has been made in C-2 on both technology and physics fronts, achieving stable plasmas up to 5 ms with a dramatic improvement in confinement, far beyond the prediction from the conventional FRC scaling. The key approaches to these exciting achievements are (1) dynamic FRC formation by collisional merging of super-Alfvénic CTs, (2) effective control of stability and transport by plasma guns and neutral beam injection, and (3) active wall conditioning. The emerging confinement scaling for this new plasma regime shows a strong dependence on temperature in contrast to the usually observed Bohm or gyro-Bohm scaling in other magnetic confinement systems. This presentation highlights these recent advances.

[1] M. Tuszewski et al., Phys. Rev. Lett. 108, 255008 (2012).

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