High beta-N experiments at JET\textsuperscript{1} CLIVE CHALLIS, Euratom/UKAEA Fusion Association, Culham Science Centre, Abingdon, Oxon OX14 3DB, UK, JET EFDA CONTRIBUTORS TEAM\textsuperscript{2} — JET has investigated the performance potential and limitations of highly triangular plasmas relevant to fully non-inductive tokamak operation. The q-profile shape has been varied from cases with highly negative core magnetic shear to low shear with \(q_0\) close to 1, allowing the effect on confinement and stability to be studied. Operation with beta-N above the no-wall ‘limit’ has been demonstrated for durations comparable with the resistive time and direct measurements of the no-wall beta have been developed as a tool for systematic performance optimization. Regimes have been developed with ITBs at reduced plasma current and toroidal field (1.2-1.5MA/2.3-2.7T) to obtain high values of beta-N and beta-P with either impurity seeding or quasi-double-null plasma configurations used to mitigate ELMs. The importance of the q-profile shape for performance optimization has been demonstrated in plasmas without ITBs (1.2MA/1.8T) with low values of minimum \(q\) (1-2) providing access to the highest beta-N (above 3).

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