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## First results from recent JET experiments in Hydrogen and Hydrogen- Deuterium plasmas

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The hydrogen campaign completed at JET in 2016 has demonstrated isotope ratio control in JET-ILW using gas puffing and pellets for fuelling, Neutral Beam Injection alone or in combination, with D $\alpha$ /H $\alpha$  spectroscopy as a diagnostic. The plasma properties such as confinement, L-H threshold, density limit depend on the isotope composition. The L-H transition power increases with the hydrogen concentration with a wide plateau in the range  $0.2 < n_D/(n_D+n_H) < 0.8$ . Energy confinement is significantly lower in hydrogen than in comparable deuterium ELMy H-mode plasmas, suggesting an isotope mass scaling that is stronger than in IPB98(y,2). In L-mode, the isotope dependence of confinement is weaker. The H-mode density limit in hydrogen is up to 35% lower than in deuterium, whilst it is found to be higher in L-mode. The lower ion mass leads to reduced tungsten sputtering in hydrogen plasmas. During the campaign, the  $n_D/(n_D+n_H)$  ratio dropped to ~1% in only a few discharges after the last deliberate introduction of deuterium, although it was seen to rise again to ~2% with several seconds of exposure of the divertor tiles to ~10MW of auxiliary heating. Several ICRH scenarios were also tested in hydrogen plasmas.

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Portugal

**Primary author:** Dr FERREIRA NUNES, Isabel Maria (IPFN/IST)

**Co-authors:** Dr KUKUSHKIN, Alexander B. (NRC Kurchatov Institute); Dr HUBER, Alexander (Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung –Plasmaphysik); Dr HUBBARD, Amanda (Massachusetts Institute of Technology, Plasma Science and Fusion Center); Dr CHALLIS, Clive (Culham Centre for Fusion Energy); Dr MAGGI, Costanza (CCFE); Dr KING, Damian (CCFE); Dr VALCARCEL, Daniel (CCFE); Dr VAN EESTER, Dirk (LPP-ERM/KMS); Dr DE LA LUNA, Elena (CIEMAT); Dr VIEZZER, Eleonora (Max-Planck-Institut fuer Plasmaphysik); Dr SOLANO, Emilia R. (EsCimat); Dr JOFFRIN, Emmanuel (CEA); Dr DELABIE, Ephrem (EURATOM-FOM association DIFFER, The Netherlands); Dr LERCHE, Ernesto Augusto (LPP-ERM/KMS); Dr JOSEP, Fontdecaba (CCFE); Mr WEISEN, Henri (JET EFDA); Dr CARVALHO, Ivo (IST); Dr BUCHANAN, James (CCFE); VARJE, Jari (Aalto); Dr HOBIRK, Joerg (IPP); Dr HILLESHEIM, Jon (Culham Centre for Fusion Energy); Dr KRIEGER, Karl (IPP); CAVE-AYLAND, Kim (CCFE); Dr GARZOTTI, Luca (United Kingdom Atomic Energy Agency - Culham Centre for Fusion Energy); Dr VALISA, Marco (Consorzio RFX); Dr VALOVIC, Martin (CCFE, UK); Dr GROTH, Mathias (Aalto University); Dr FAITSCH, Michael (IPP); Dr ROMANELLI, Michele (CCFE); Dr MASLOV, Mikael (CCFE); Dr STAMP, Mike (CCFE); Dr MANTICA, Paola (Istituto Di Fisica Del Plasma, Consiglio Nazionale delle Ricerche (CNR), 20125 Milan, Italy); Dr SIREN, Paula (ENEA); Dr BREZINSEK, Sebastijan

(Forschungszentrum Jülich); Dr WIESEN, Sven (Forschungszentrum Jülich); Dr TALA, Tuomas (VTT, Association Euratom-Teke); Dr NEVEROV, Vladimir (Kurchatov Institute); Dr KAZAKOV, Yevgen (Laboratory for Plasma Physics, LPP-ERM/KMS); Dr KRASILNIKOV, anatoli (Director Institution @Project center ITER”)

**Presenter:** Dr FERREIRA NUNES, Isabel Maria (IPFN/IST)

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