

The isotope effect in the RFX-mod experiment (EXP/P1-41)



CONSORZIO RFX
Ricerca Formazione Innovazione

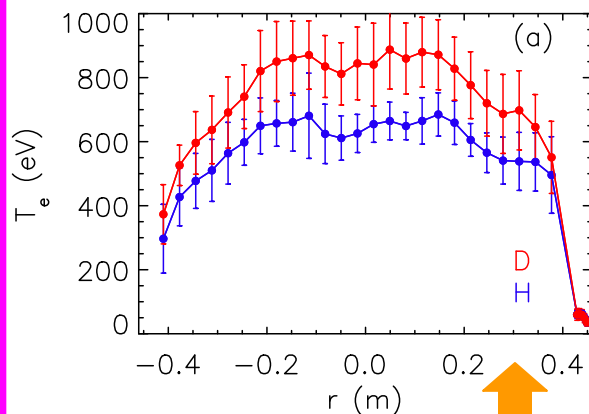
The **ISOTOPE EFFECT** is the dependence of **MHD and confinement** on the mass M_i of the isotope of the main gas
In which magnetic configurations is it observed?

TOKAMAK: YES

STELLARATOR: NO

What about **REVERSED FIELD PINCH** ?

This study shows for the first time that *MHD and confinement of the RFPs do depend on the mass* of the isotope used. The comparison between Deuterium and Hydrogen plasmas in RFX-mod experiments shows that *plasma performances improve with the isotope mass.*



In Deuterium plasmas, with respect to Hydrogen ones...

MHD

- ... saturation amplitude of tearing modes is reduced
- ... Quasi Single Helicity states are longer and purer
- ... the dynamo process becomes more discrete

Confinement

- ... electron temperature is higher → energy confinement time scales as $M_i^{0.35}$
- ... particle influx is lower → particle confinement time scales as $M_i^{0.7}$