Particle transport due to energetic particle driven geodesic acoustic modes

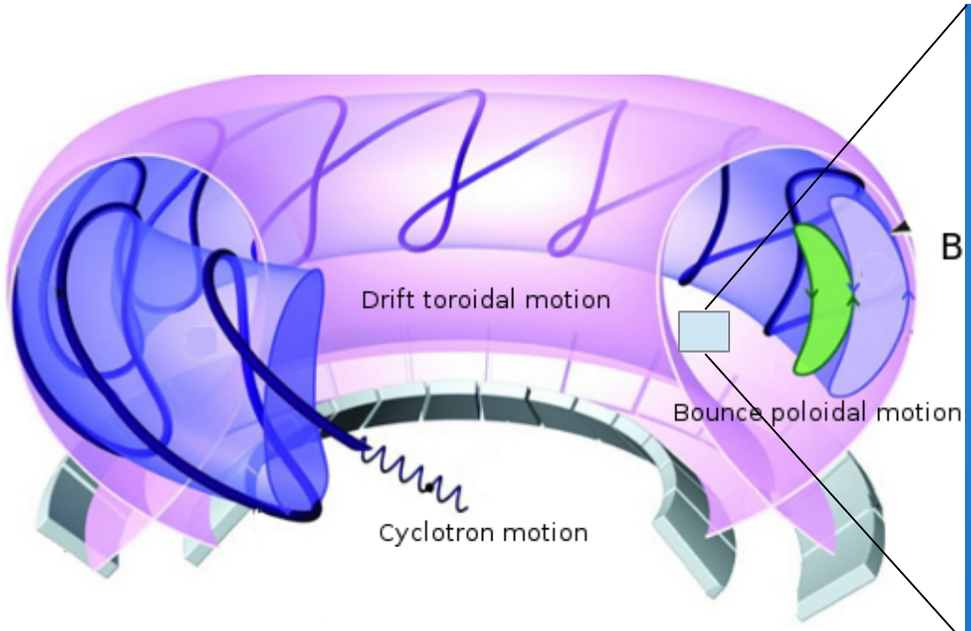
David Zarzoso[1], Diego del Castillo Negrete[2], Dominique Escande[1], Xavier Garbet[3], Virginie Grandgirard[3], Guillaume Latu[3], Chantal Passeron[3], Yanick Sarazin[3]

[1] *Aix Marseille Université, CNRS, PIIM UMR 7345, 13397, Marseille, France*

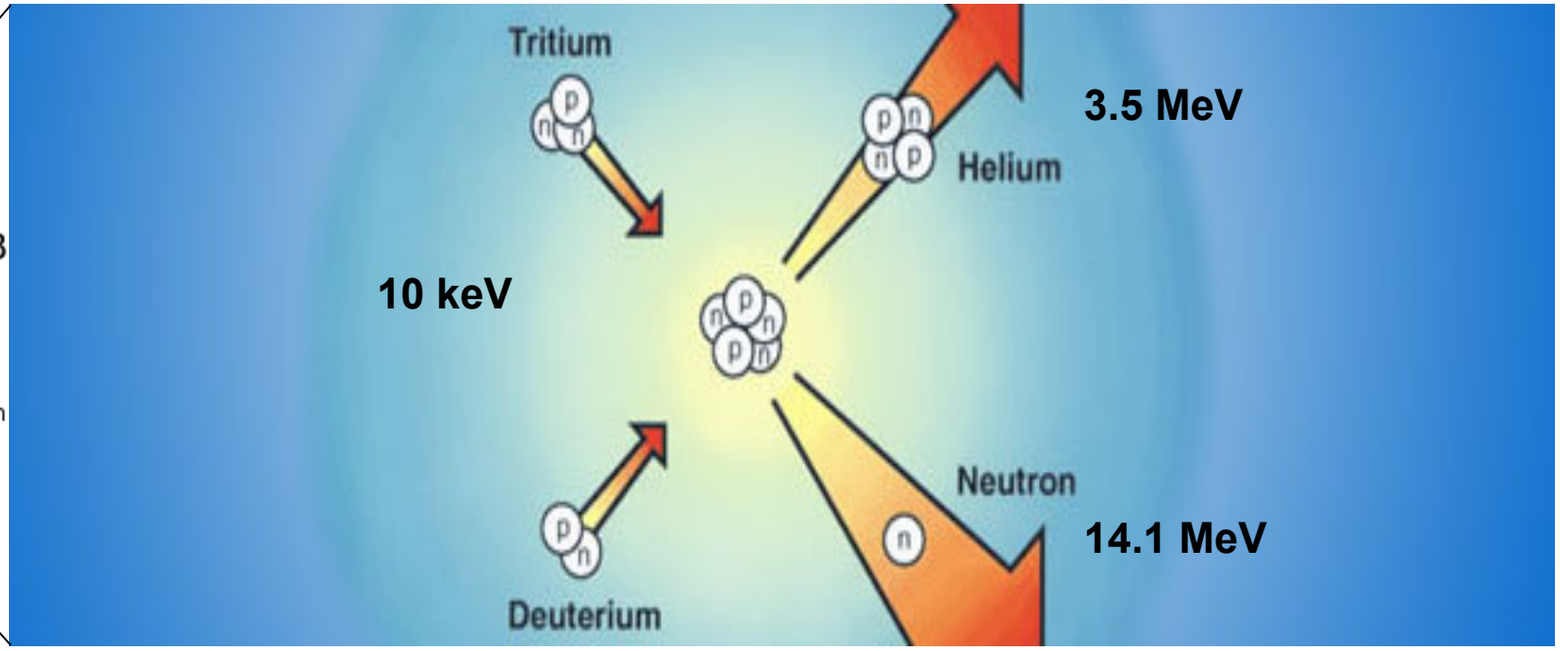
[2] *Oak Ridge National Laboratory, Oak Ridge, Tennessee 37830*

[3] *CEA/IRFM Cadarache, 13108 Saint-Paul lez Durance, France.*

Within the framework of
EUROfusion project on Nonlinear Energetic Particle Dynamics (F. Zonca)
EUROfusion project on GK verification (E. Sonnerdrücker)



Tokamak



Can energetic modes modify particle orbits (Passing —> Trapped)?

EGAM island interacts with trapping cone —> Losses

Magnetic trapping island → $\mathcal{H}_{\text{no EGAM}} = \frac{1}{2}v_{\parallel}^2 - B_0\left(1 - \frac{r}{R_0}\mu\cos\theta\right)$

EGAM island → $\mathcal{H}_{\text{EGAM}} = \frac{1}{2}\left(v_{\parallel} + q\omega_{\text{EGAM}}\right)^2 + \phi_{\text{EGAM}}\cos\left(\theta - \omega_{\text{EGAM}}t\right)$

Trapping island enlarges as particles explore increasing r due to EGAM