

PTOLEMY

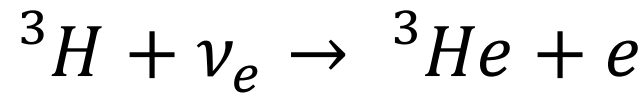
proof-of-principle

Preventivi 2020

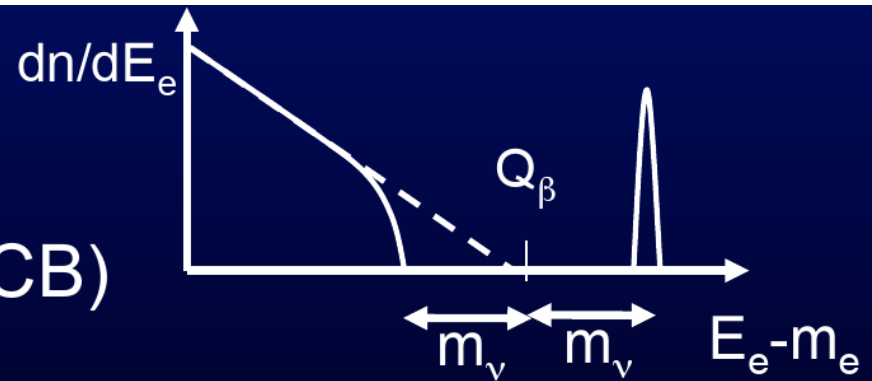
M. Biasotti

PTOLEMY final Scientific goal

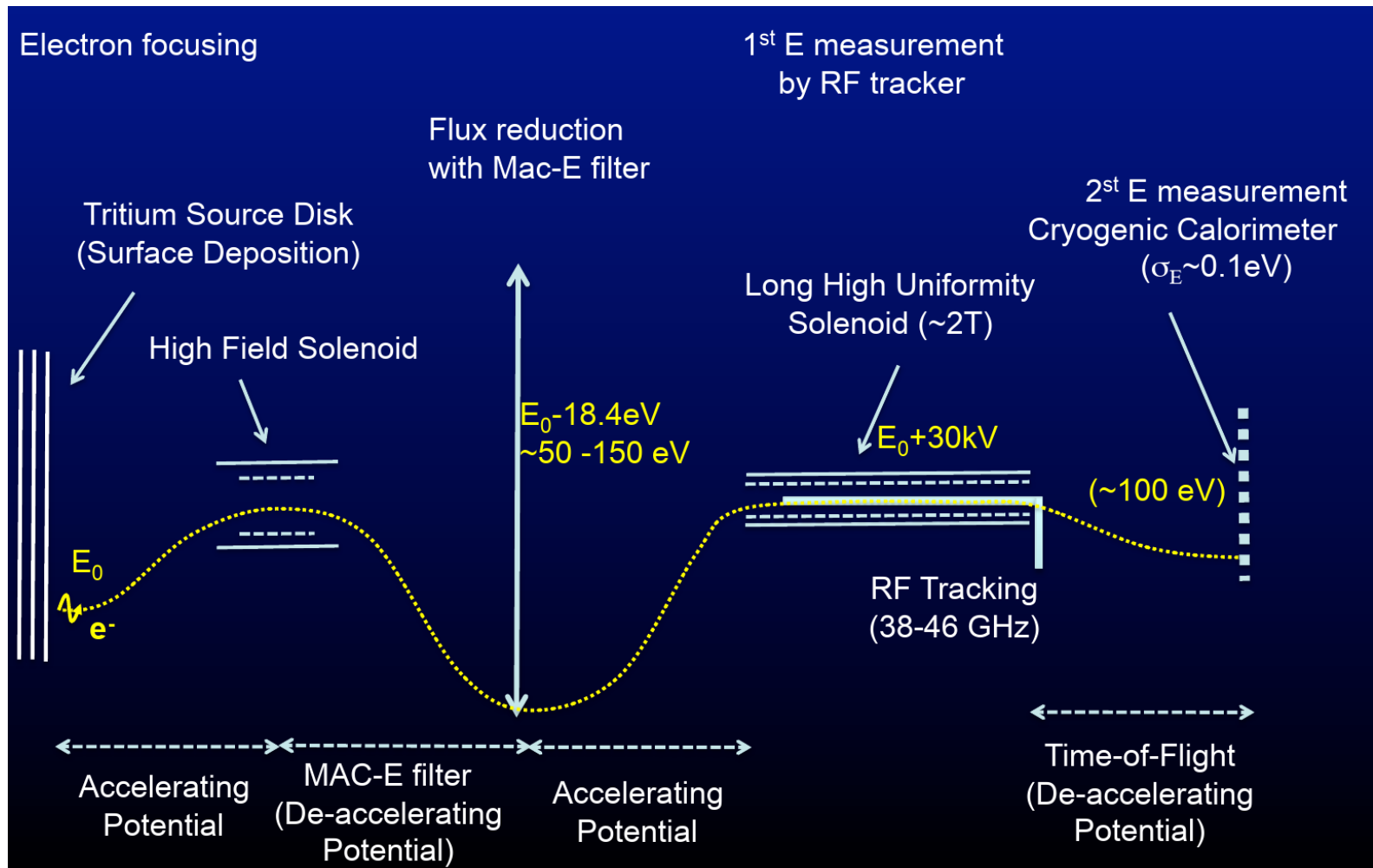
To observe relic neutrinos using tritium beta decay:



Neutrino Capture on a
Beta Decaying Nucleus (NCB)



PTOLEMY conceptual design



The proof-of-principle

- Phase I : Proof-of-principle (3 to 5 years)
 - Detector: achieve energy resolution of ~ 0.1 eV
 - Graphene: validate as target source,
 - Background level



Phase II:

Technical design for a scalable detector

Phase III:

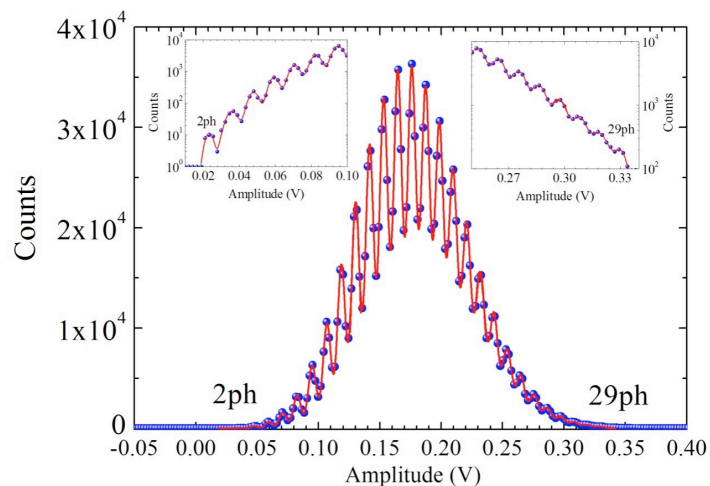
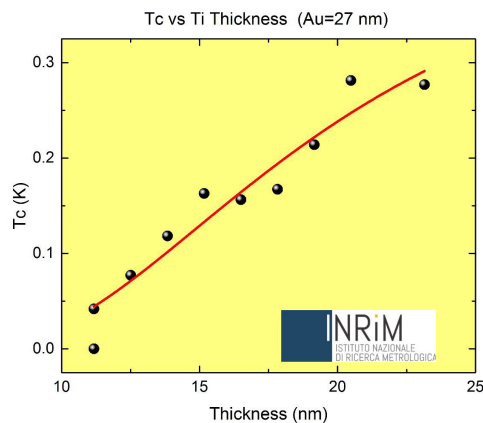
Full detector construction and search for relic neutrino

Collaboration

- Physics cases (**INFN Na + Pi** – Spain - PU)
- TES Calorimeter (INRIM – **INFN Ge + MiB**)
- High Radiopure C (Princeton Univ.)
- EM filter design (**INFN Na** – PU)
- Graphene studies for Tritium and DM (**INFN Rm** – Spain - PU)
- Prototype tests (**INFN Na + LNGS** – NYU)
- High stability HV and calibration (NYU)
- Cryogenics (**INFN LNGS**)
- Modeling and Simulation (INFN - Sweden)
- Outreach (Princeton U.)

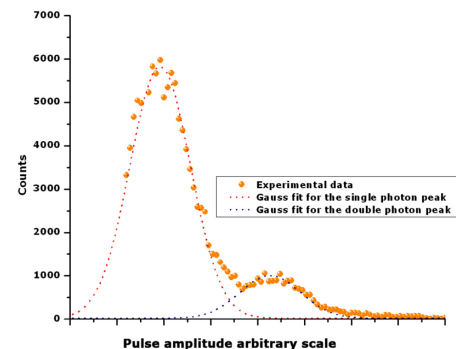
TES as detector for sub-eV energy resolution

- TES could be good detector with the necessary resolution.
- Collaboration with INRiM to TES development.
- Possibility of know-how transfer.



L. Lolli, et al. *J. Low Temp. Phys.*, vol. 167, pp. 803-808, 2012.

D. Bagliani et al.
J. Low. Temp. Phys.
151: 234-238 (2008)



Anagrafica e richieste di sezione

M. Biasotti	10%	UniGE-associato INFN
M. Rajteri	30%	INRiM associato INFN
E. Monticone	30%	INRiM associato INFN

Per quest'anno non si prevedono impegni particolari per i servizi di sezione

(< 1 m. u. Progettazione+officina nel complesso)

Possibilità di aumento dell'attività a partire dal 2021