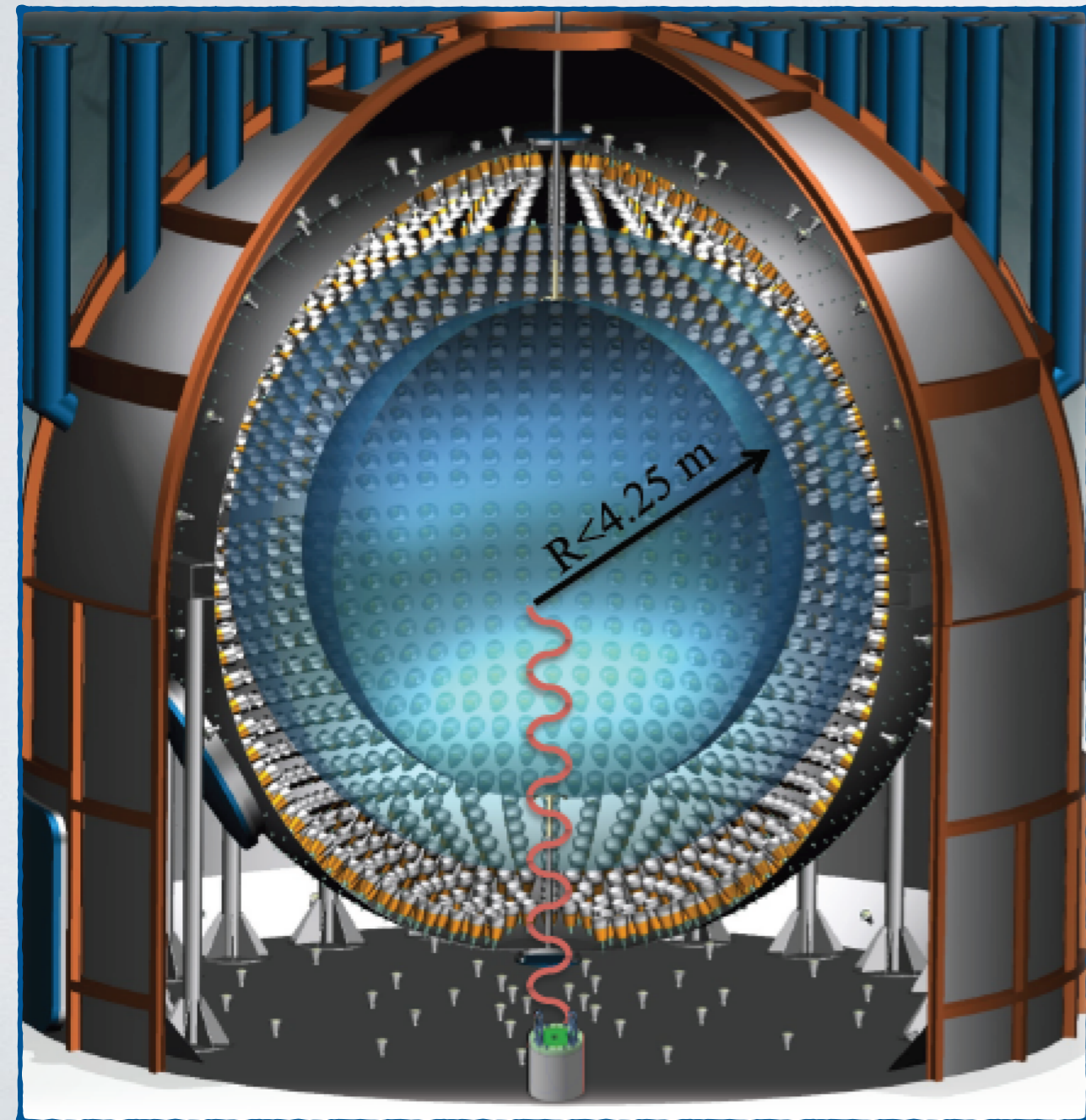
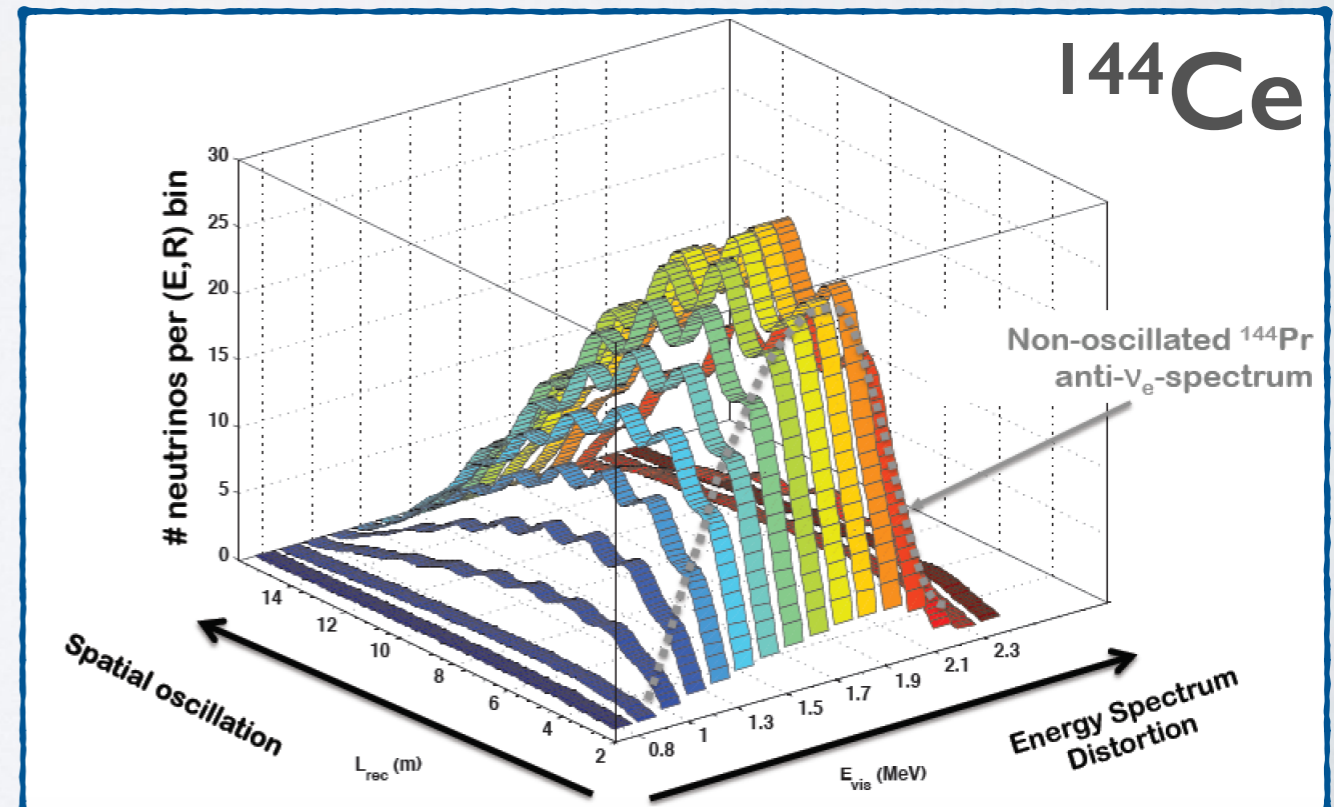
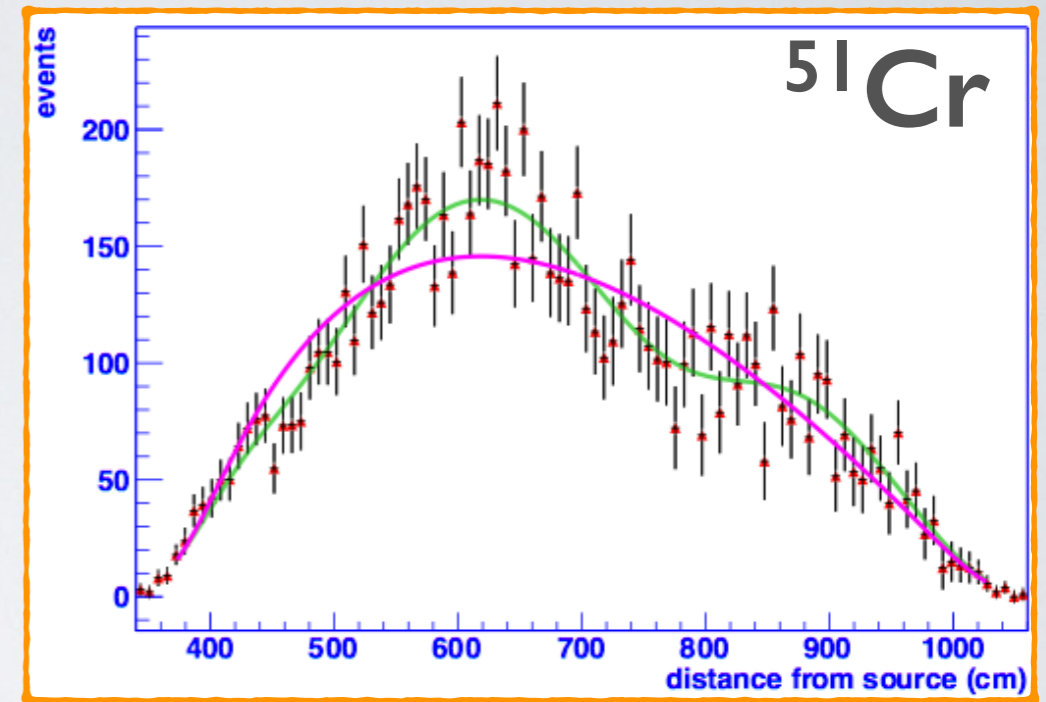
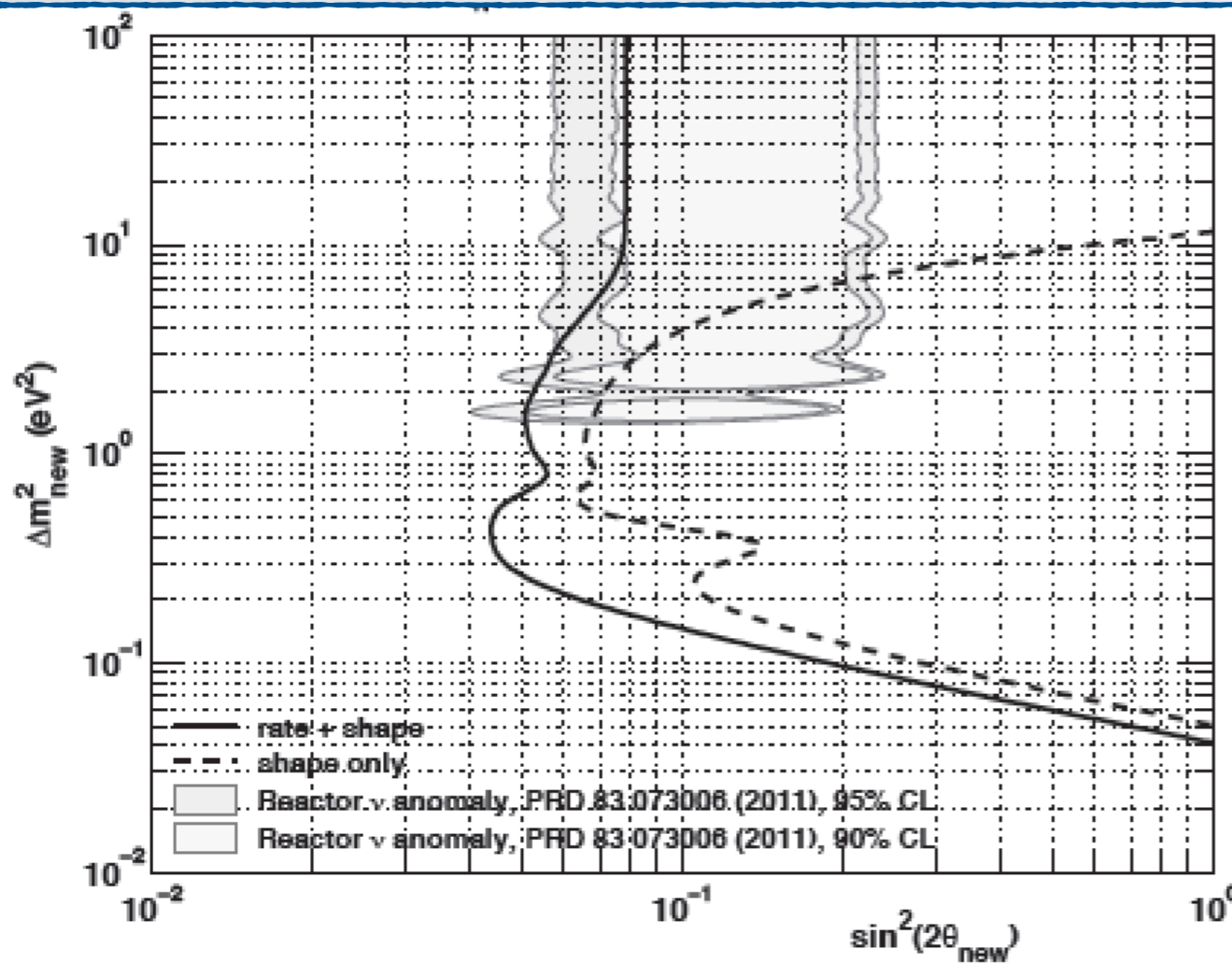


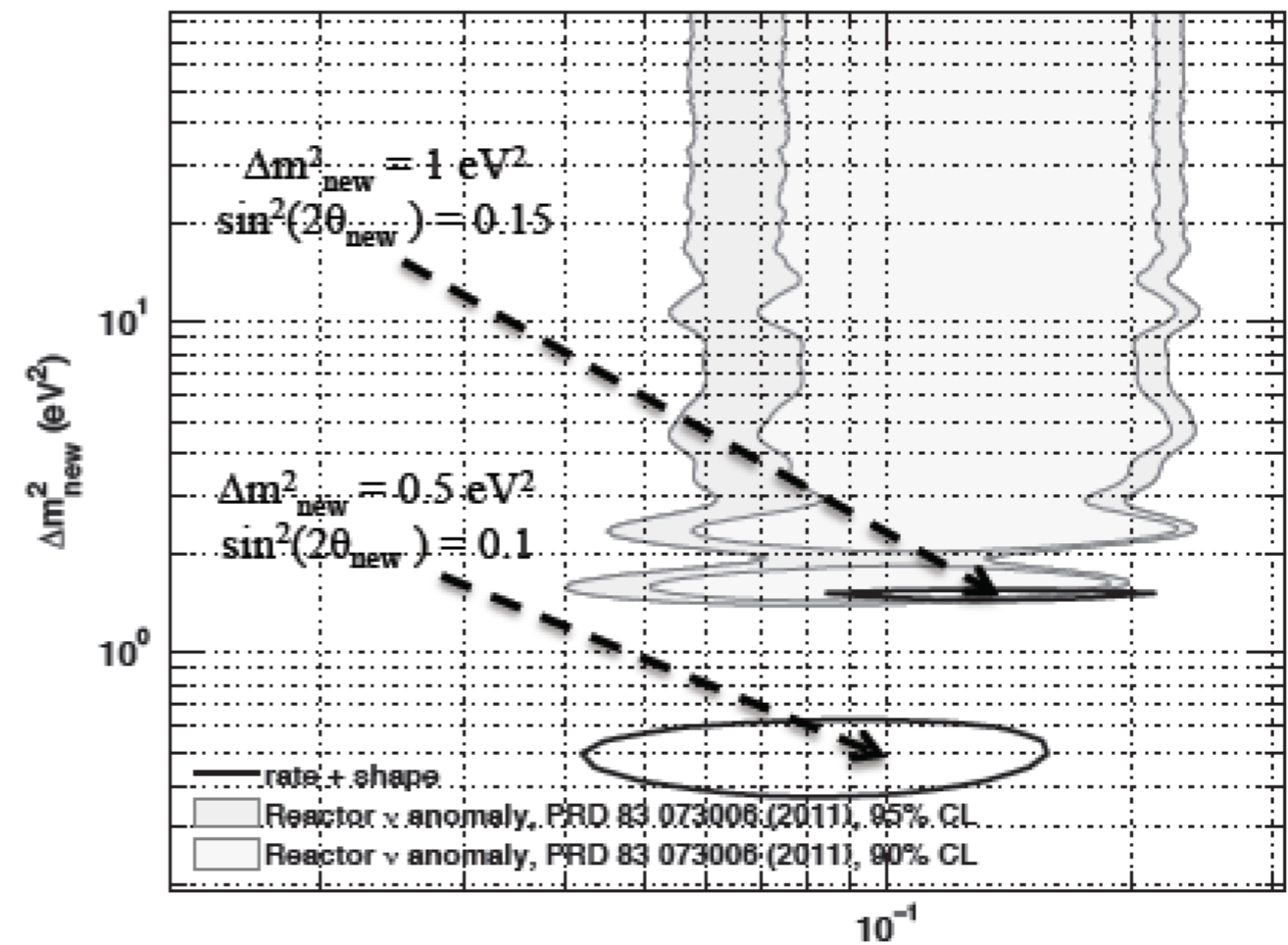
- SOX is at the same time a disappearance experiment and an oscillometry one
 - Goal: 1% knowledge of source activity (calorimetry)



- 3.7 PBq ^{144}Ce known at 1.5% and at 8.2 m from Borexino center



Exclusion (90% c.l.)



Discovery (99% c.l.)

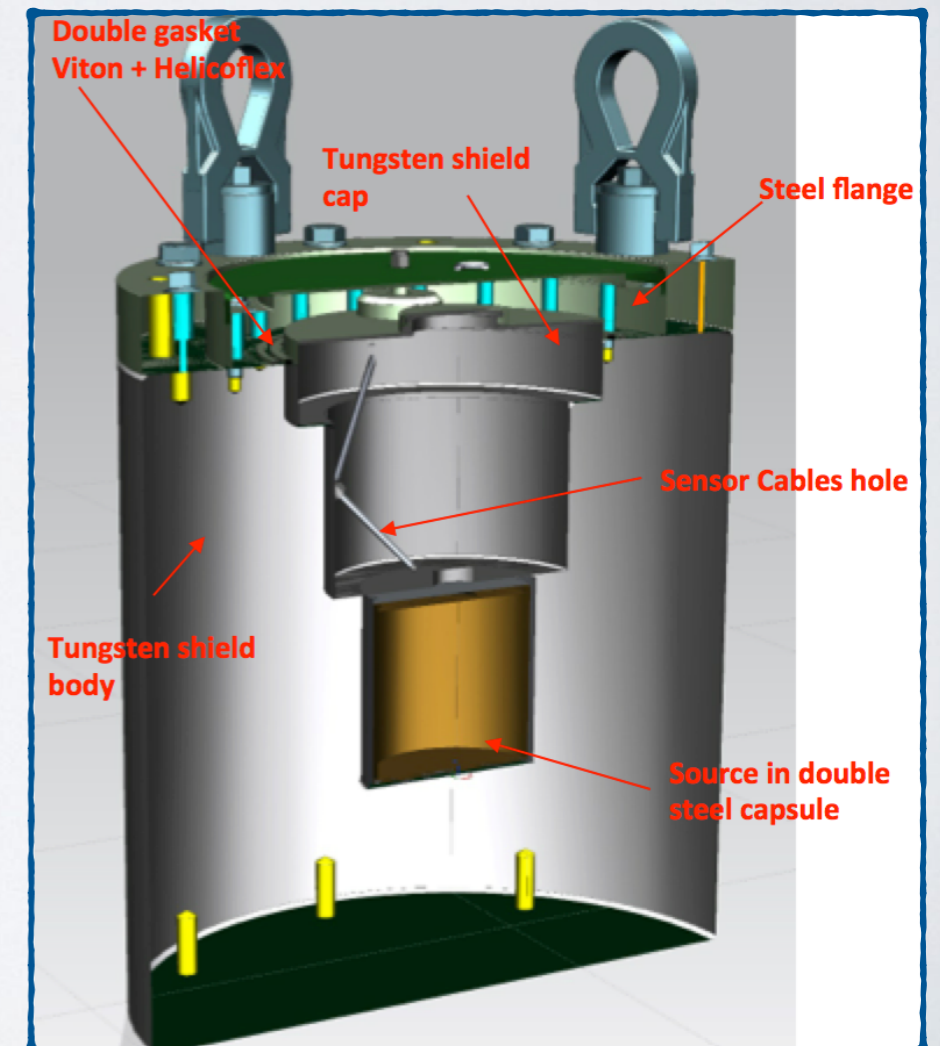
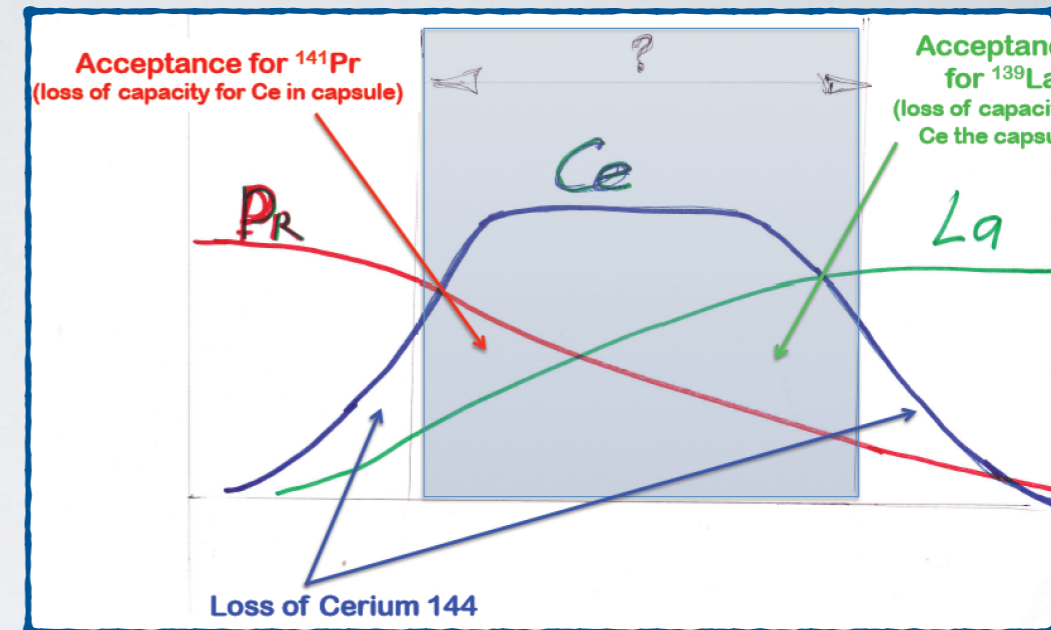
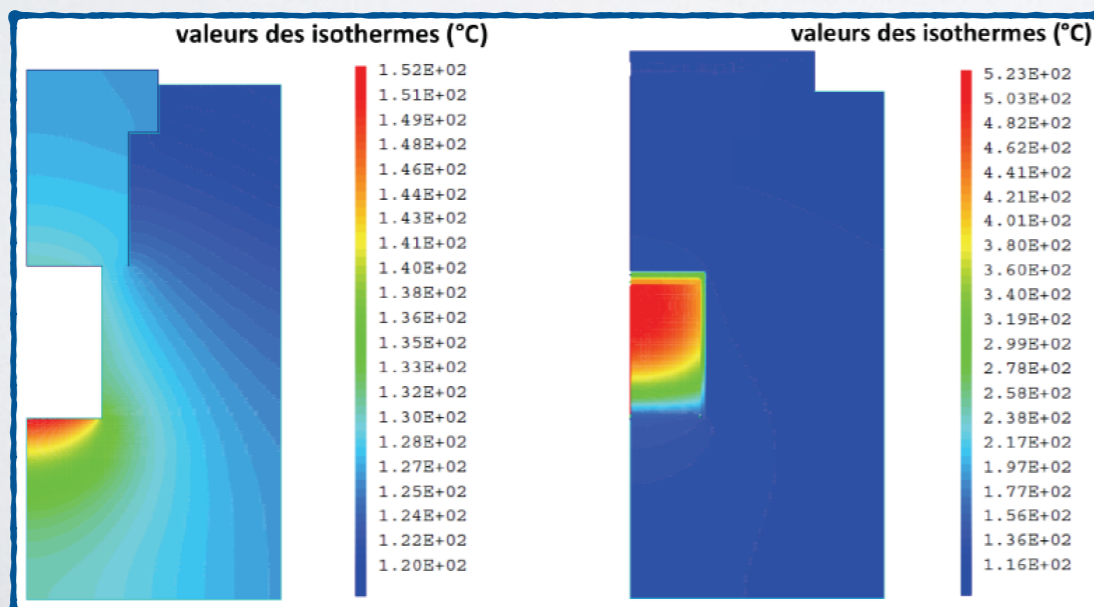
for more details on CeANG see e.g.
T. Lasserre talk at Venice 2015

Specs

- >3.7 PBq (^{144}Ce only); powder 4-6 g cm $^{-3}$ density
- CeO $_2$ with Ce from fresh spent fuel (<2 y old)
- Purity
 - Rare Earth: γ rate < 10 $^{-3}$ Bq/Bq w.r.t. ^{144}Ce
 - Pu and actinides: < 10 $^{-5}$ Bq/Bq w.r.t. ^{144}Ce (max 10 5 n/s)

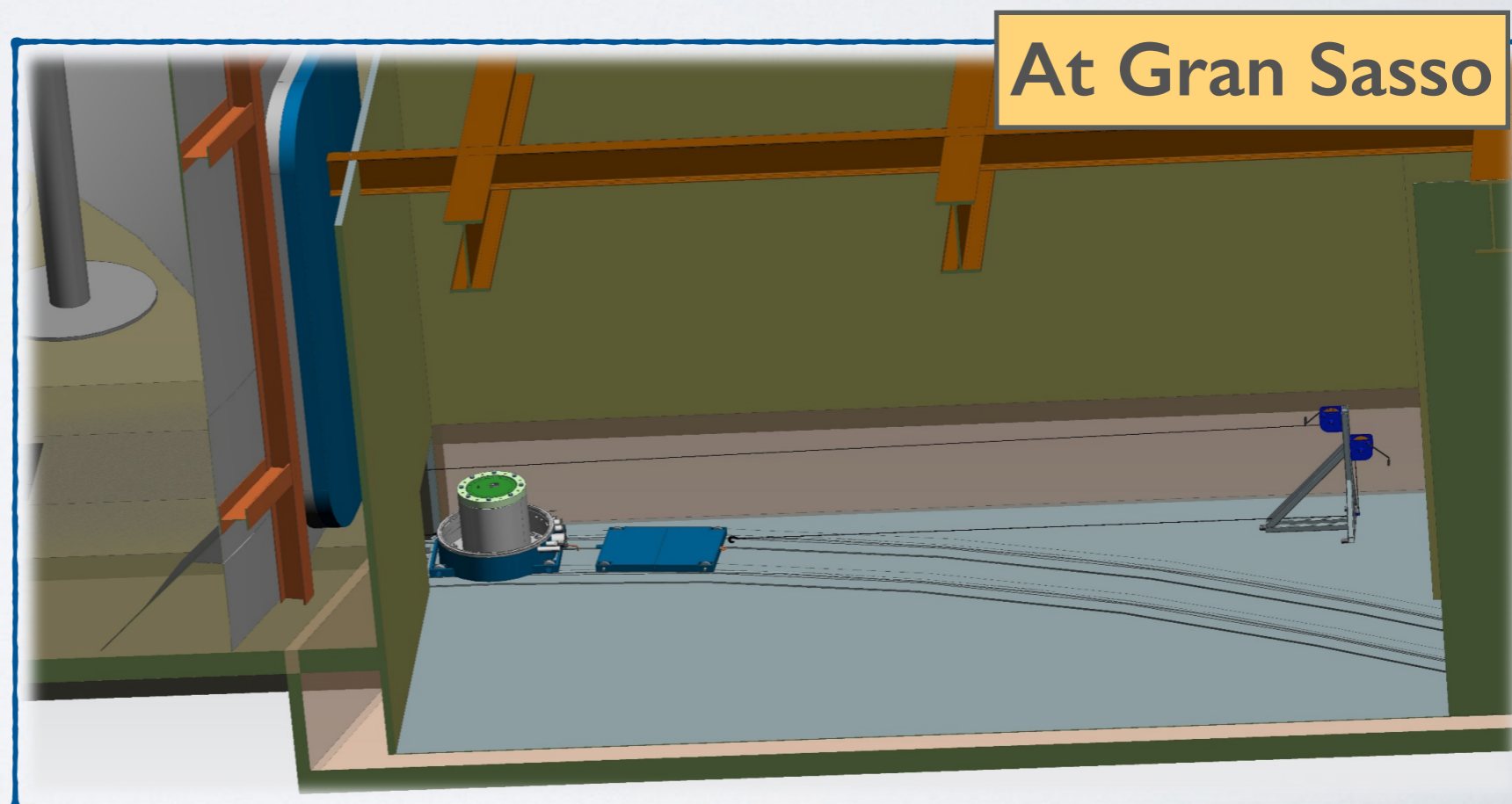
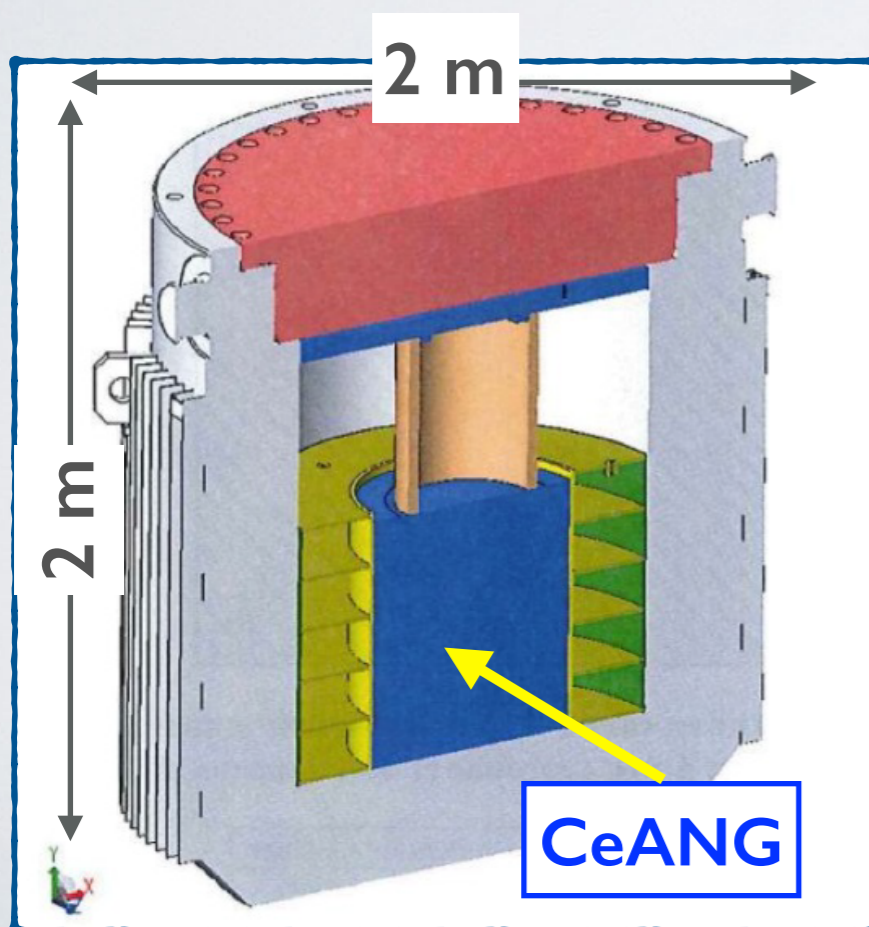
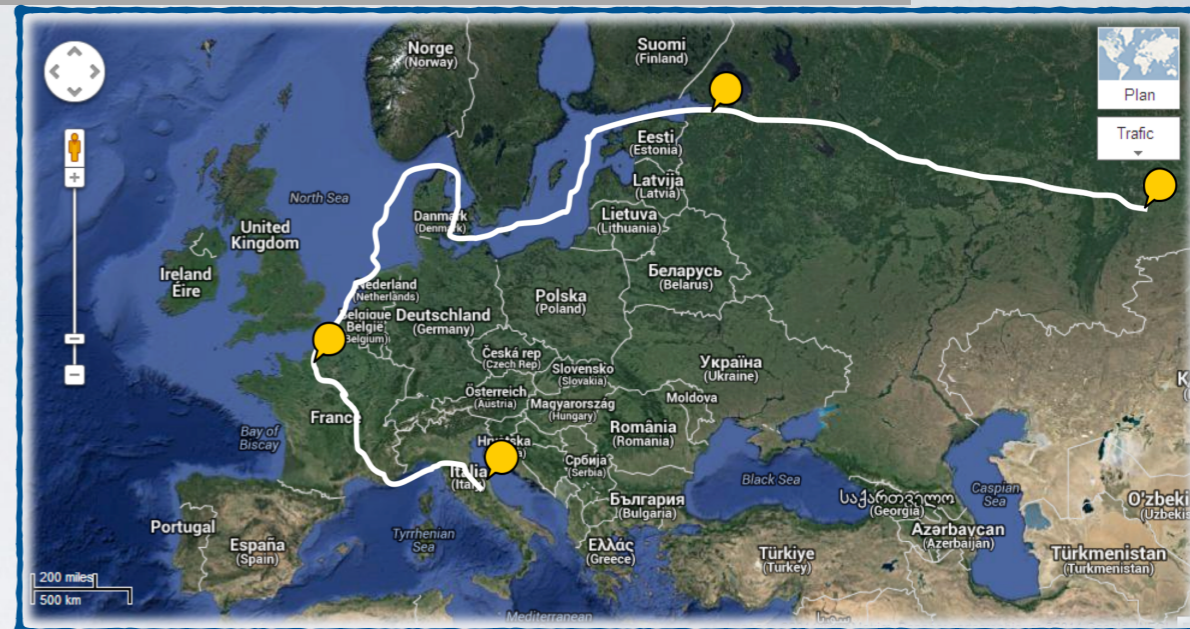
Production

- Key: separation of Ce from other REE with chromatography
- CeO $_2$ powder sealed in a container
- Container inserted into a 19 cm thick W shield
- Internal T ~ 500 °C; surface T @ 20:°C ~ 80 °C



for more details on CeANG see e.g.
T. Lasserre talk at Venice 2015

- A long way (~1-2 months):
 - Mayak → St. Petersburg by train
 - St. Petersburg → Le Havre by boat
 - Le Havre → Saclay → LNGS by truck
 - Container: TN MTR
 - 24 t container for nuclear fuel (CEA)
 - IZOTOP (Russia), AREVA (Main contractor, France) + MIT (Italy) will handle the long journey



- Attività
 - P.I.
 - Contenitore di Tungsteno (progettazione e gara)
 - Calorimetro:
 - conceptual design
 - progetto di dettaglio (in collaborazione con Monaco)
 - costruzione (parziale)
 - sensori e misure
 - Analisi dati
 - Simulazione
 - Analisi anti-neutrini (dall'esperienza geo-neutrini)
 - Installazioni al gran sasso
 - Modifiche e adattamenti clean room
- Contratto con Mayak firmato giugno 2015; sorgente a LNGS dicembre 2016;
 - Fisica: 1.5 y di dati con la sorgente