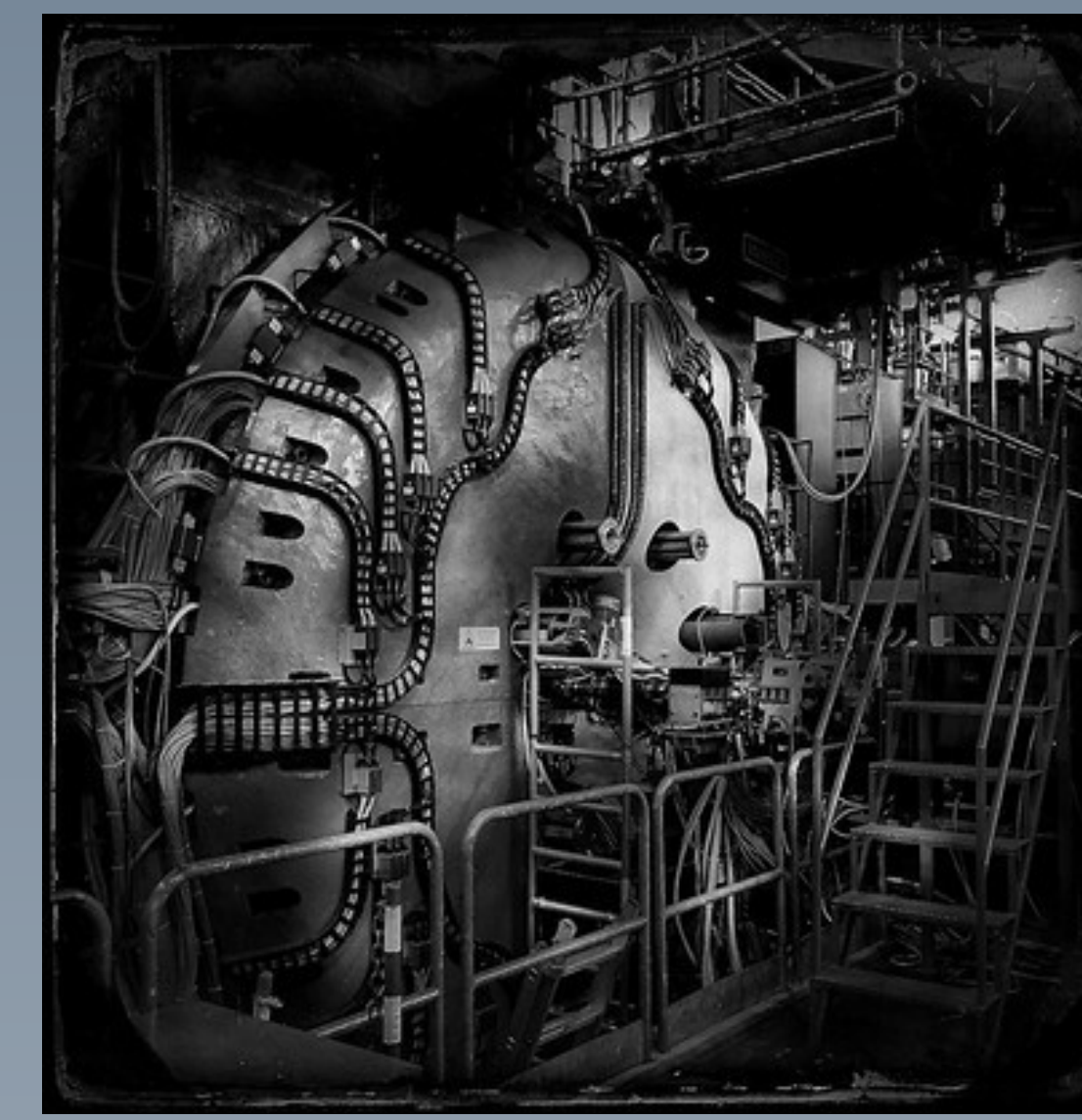
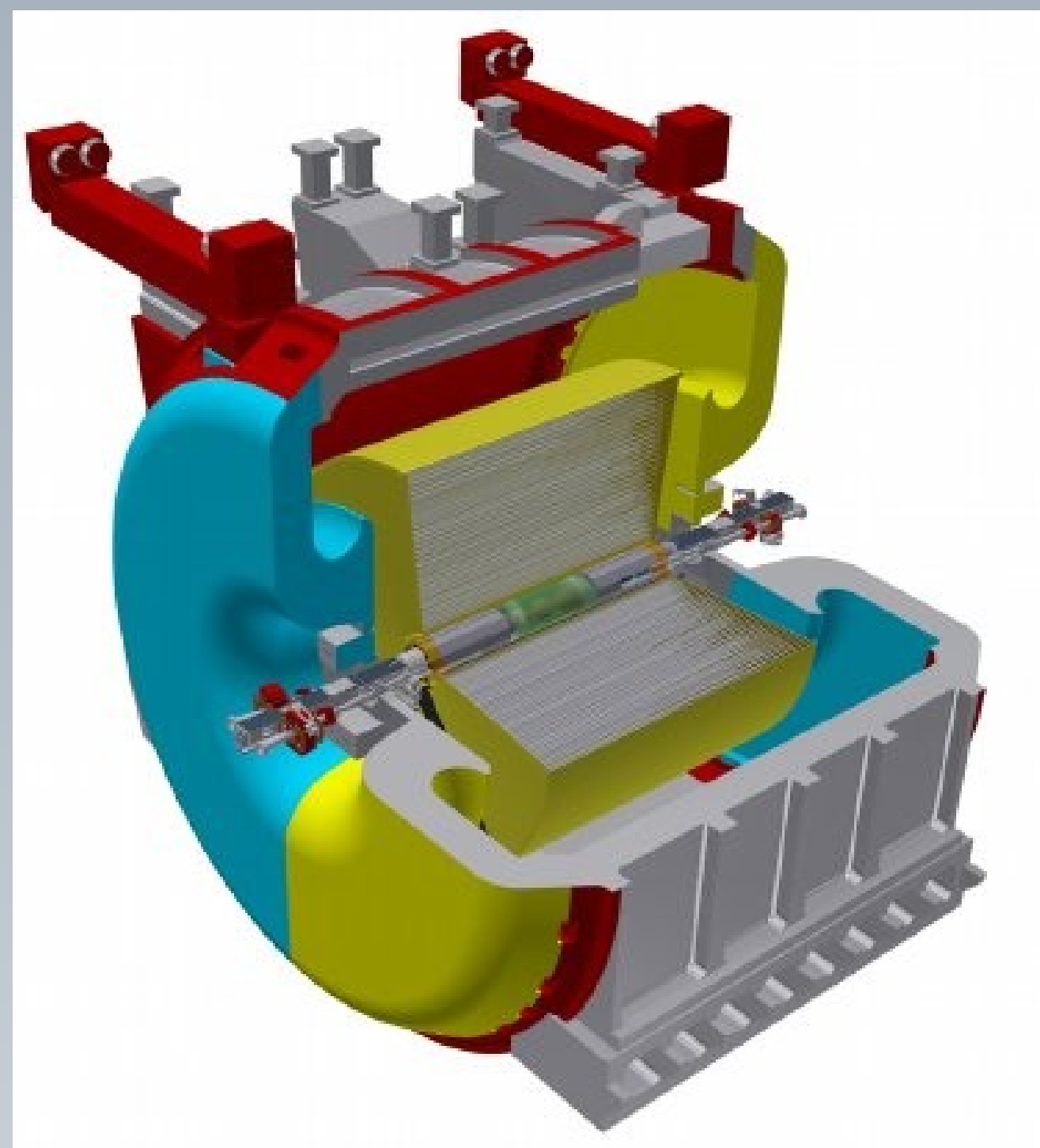
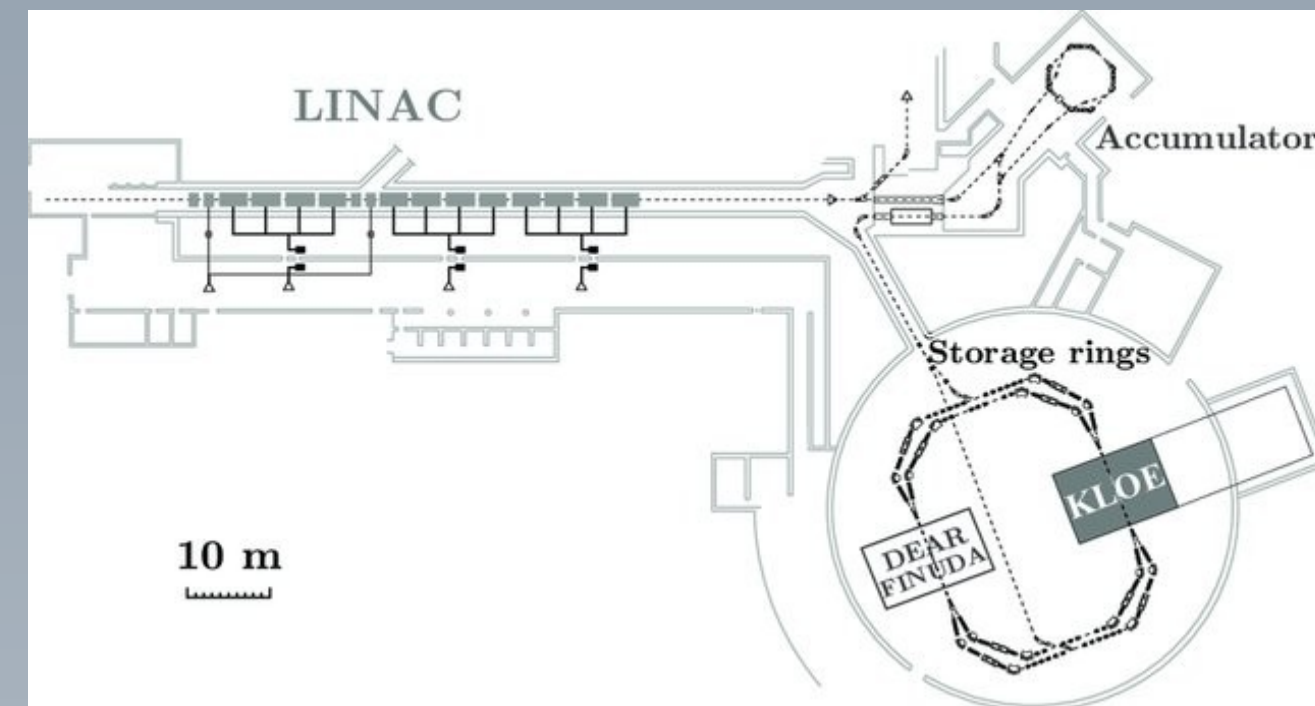
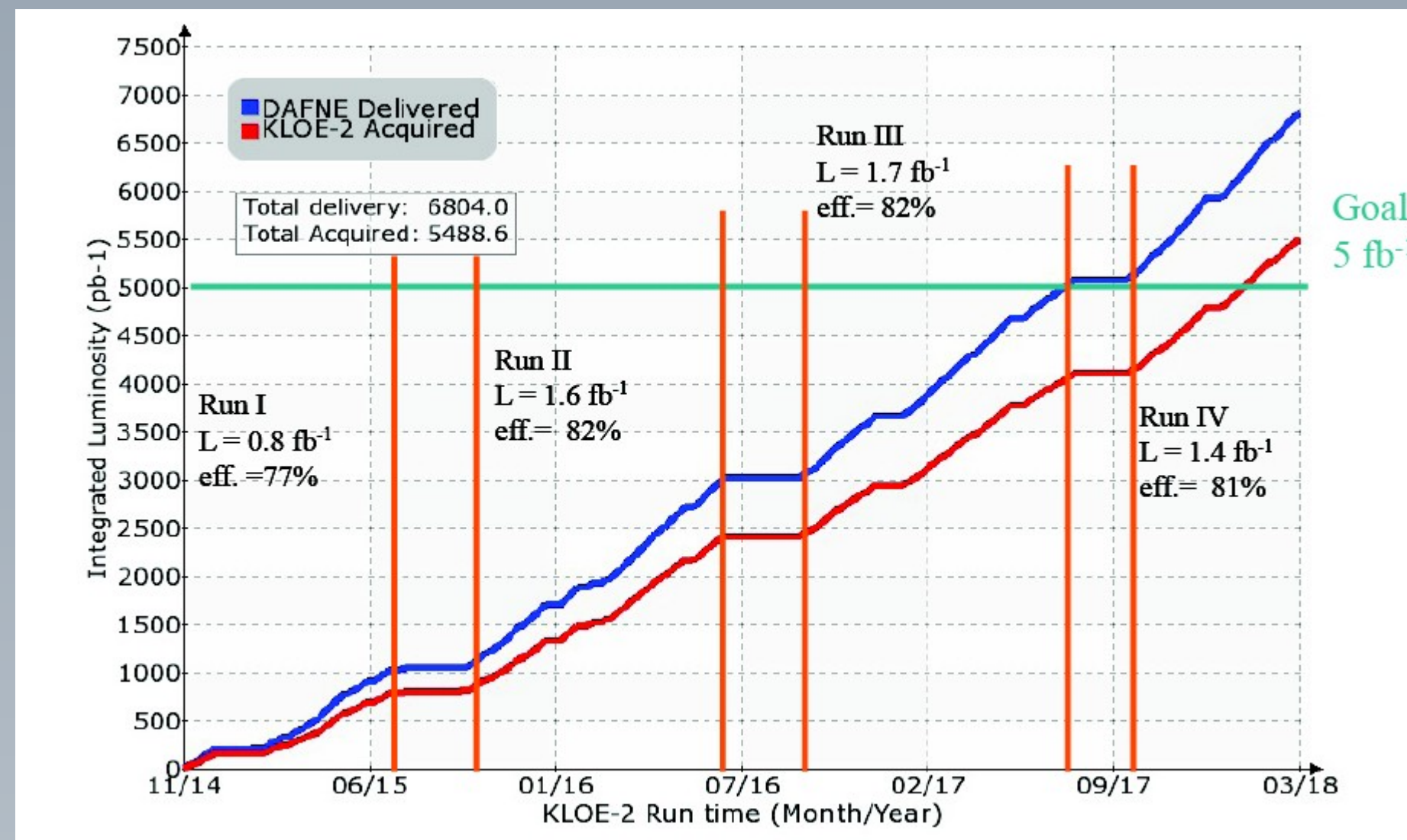


B boson search at KLOE/KLOE-2

Elena Perez del Rio on behalf of the KLOE-2 collaboration



KLOE/KLOE-2 at DAΦNE Φ-factory



KLOE 2000-2006
2.5 fb⁻¹ at $\sqrt{s} = M_\Phi$
250 pb⁻¹ off-peak

KLOE-2 2014-2018
5.5 fb⁻¹ at $\sqrt{s} = M_\Phi$
KLOE+KLOE-2: 2.4 x 10¹⁰ Φ(1020) mesons

KLOE Analysis

- Study on ~1.7 fb⁻¹ KLOE data sample 5 γ's final state with η and π⁰
- Background is estimated from a side-band fit excluding the signal region
- Kinematic fit to improve energy resolution
- Signal: would show as a narrow peak in the M(π⁰γ) distribution
- Main residual backgrounds:
 - Φ → a0γ → ηπ⁰γ and
 - Φ → ηγ → 3π⁰γ with lost or merged photons.
- Extraction of Upper Limit is ongoing

Leptophobic B boson

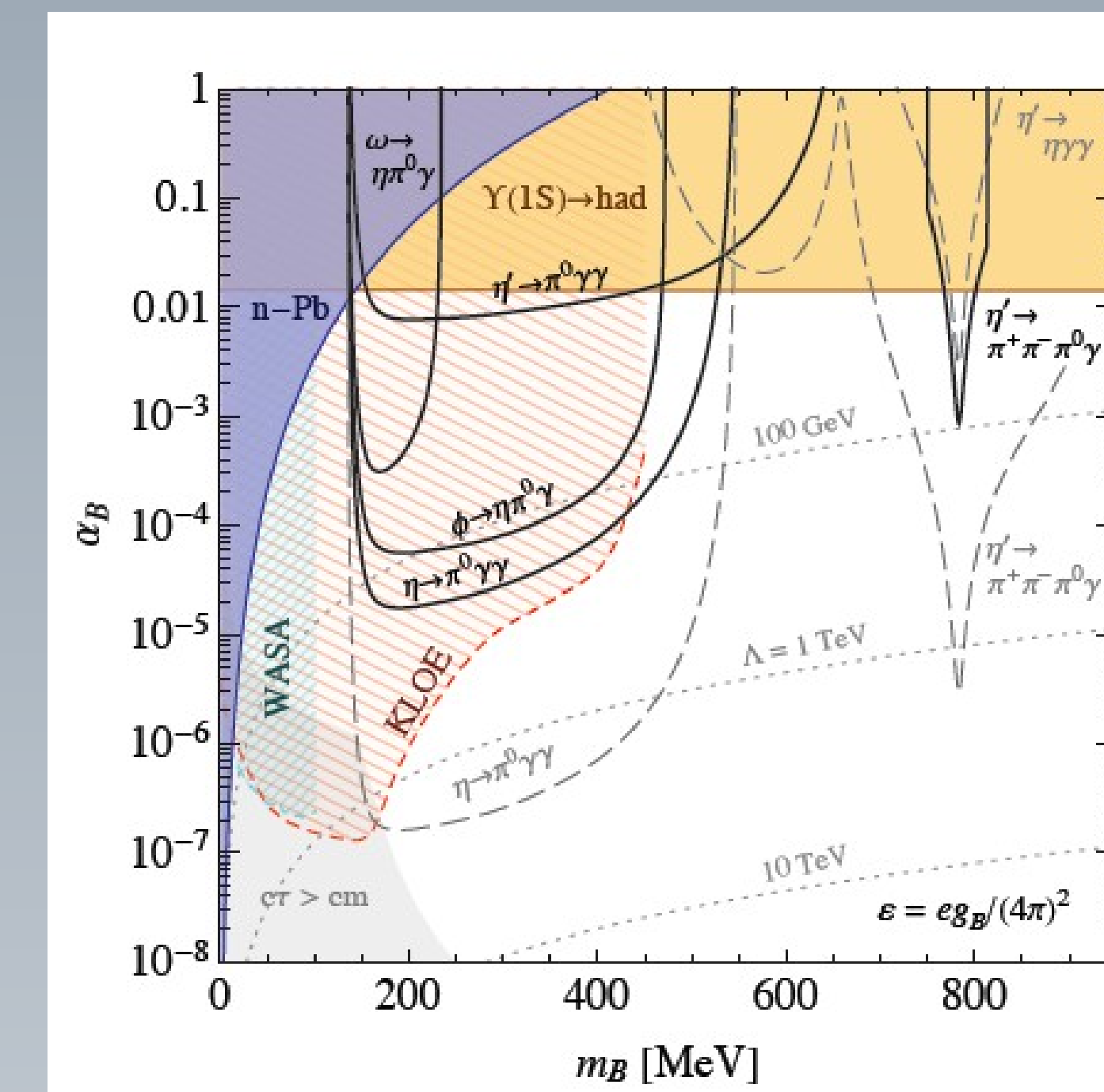
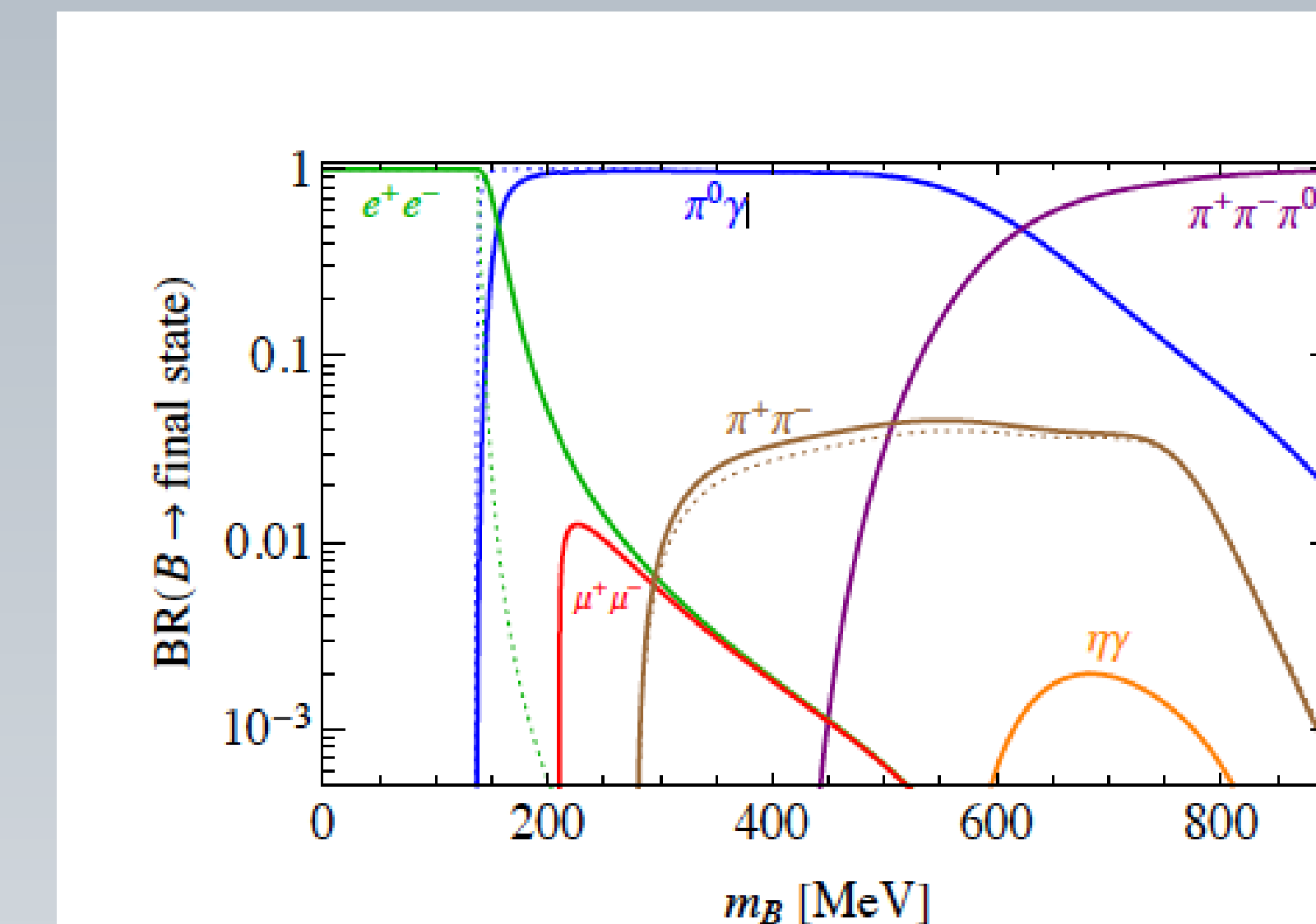
Dark Force mediator coupled to baryon number (B-boson) with the same quantum numbers of the ω(782) ⇒ I^G=0⁻
Can have an impact in (g-2) muon anomaly

$$\mathcal{L} = \frac{1}{3} g_B \bar{q} \gamma^\mu q B_\mu \quad \alpha_B = \frac{g_B^2}{4\pi} \lesssim 10^{-5} \times (m_B/100\text{MeV})$$

Dominant decay channel (m_B < 600 MeV): **B → π⁰γ**
Can be studied in:

Φ → ηB ⇒ ηπ⁰γ ⇒ 5 prompt γ final state
η → Bγ ⇒ π⁰γγ ⇒ only one π⁰
e⁺e⁻ → Bγ_{ISR} → π⁰γ γ_{ISR}

KLOE-2 Physics Program
[Eur.Phys.J. C68 (2010) 619-681]



[Tulin, PRD89(2014)114008]

