Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **266** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

RARE ETA AND ETA-PRIME DECAY PROGRAM AT HALL D/JEFFERSON LAB*

Tuesday 10 June 2025 17:15 (15 minutes)

Measurements of several rare η and η′ decay channels will be carried out with an upgraded GlueX detector in Hall D as part of the Jefferson Lab Eta Factory (JEF) program. JEF will commence in late March 2025: the combination of highly-boosted η/η′ production, recoil proton detection, and a new fine-granularity high-resolution lead-tungstate insert in the GlueX forward calorimeter confers uniqueness to JEF, compared to other experiments worldwide. JEF will search for new sub-GeV gauge bosons in portals coupling the Standard Model sector to the Dark sector, will provide constraints on C-violating/P-conserving reactions, and will allow precision tests of low-energy QCD. Simulations have been driving methods towards significant background reduction and signal isolation for key rare decay channels: the γp ⟶ ηp, η ⟶ π+ π− e+ e− channel will be shown as an example. Details on the hardware upgrade and initial look at the commissioning of the device will also be presented.

Keyword-1

Eta Meson Rare Decays

Keyword-2

Electromagnetic C

Keyword-3

Author: THOMSON, MacQuarrie (University of Regina)

Co-authors: Mr TAYLOR, Simon (Thomas Jefferson National Accelerator Facility); Mr ORESIC, Stjepan (University of Regina); Mr PAPANDREOU, Zisis (University of Regina)

Presenter: THOMSON, MacQuarrie (University of Regina)

Session Classification: (DPP) T3-5 Laser Plasma Interaction & Complex Plasmas | Interaction laser-plasma et plasmas complexes (DPP)

Track Classification: Technical Sessions / Sessions techniques: Plasma Physics / Physique des plasmas (DPP)