

**HADRONS**  
**2025 Porto Alegre**  
XVI International Workshop on Hadron Physics  
**10-14 Mar | Centro Cultural da UFRGS**

**Invited speakers**

**Kenji Fukushima**  
The University of Tokyo

**Chun Shen**  
Wayne State University

**Lisheng Geng**  
Beihang University

**Fernanda Steffens**  
University of Bonn

**National Committee**

Kanchan Khemchandani (UNIFESP)  
Jun Takahashi (UNICAMP)  
Letícia Palhares (UERJ)  
Luciano Abreu (UFBA)  
Ricardo Sonego Farias (UFSM)  
Victor Gonçalves (UFPel)  
Tiago Nunes (UFSC)

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Victor Gonçalves (UFPel) - Chair  
Gustavo Gil da Silveira (UFRGS)  
Magno Machado (UFRGS)  
Ricardo Sonego Farias (UFSM)

**Registrations open from**  
**10 Aug 2024 to 14 Feb 2025**  
<https://indico.cern.ch/e/hadrons2025>

**if** **PPG FÍSICA UFRGS** **FAPESP** **CAPES** **FAPERGS**



**Começar (Iniciar)** 10 de mar. de 2025 09:00  
**Fim** 14 de mar. de 2025 19:00

America/Sao\_Paulo



Centro Cultural - UFRGS  
Jacarandá Auditorium  
Rua Eng. Luiz Englert, 333 - Porto Alegre-RS  
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Victor Goncalves



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ID da Contribuição: 112

Tipos: **Poster**

## Renormalons in the QCD spectral function, experimental data, and potential implications to the muon $g-2$

*segunda-feira, 10 de março de 2025 17:56 (2 minutos)*

The muon anomalous magnetic moment,  $g-2$ , is one of the most precisely measured quantities in physics. On the theoretical side, however, the Standard Model (SM) prediction does not achieve the same level of precision, primarily due to the uncertainty in the hadronic vacuum polarization (HVP) contribution. At energies between 2 and 3.7 GeV, perturbative QCD (pQCD) is often used for the prediction of the HVP contribution to  $g-2$  and this method relies on the determination of the celebrated observable  $R(s)$ , or, equivalently, the spectral function. Recently, a discrepancy has been observed between the latest and more precise BES-III data and the pQCD prediction for  $R(s)$ . In order to investigate the origin of this tension, it is essential to analyze the spectral function in detail. In this work, we examine the perturbative series of the spectral function both in the so-called large- $\beta_0$  limit and in full QCD at different energy scales. We explore the potential implications of their renormalon structure on the spectral function's behavior, which directly impacts  $R(s)$  and, consequently, the HVP contribution to  $g-2$  (denoted as  $a_\mu^{HVP}$ ). Additionally, we present our preliminary results for the calculation of  $a_\mu^{HVP}$  between 2-3GeV using a data-driven approach, along with a comparison to the pQCD prediction.

**Autores:** CARAM, Marcelle (University of Sao Paulo); Dr. BOITO, Diogo (University of Sao Paulo)

**Apresentador:** CARAM, Marcelle (University of Sao Paulo)

**Classificação da Sessão:** Poster session