



UNIVERSIDAD TECNICA  
FEDERICO SANTA MARIA

Departamento de Física

## Seminario Grupo de Física de Altas Energías

### “Operator Bases and RGEs for Dim-7 Operators in the SMEFT”

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#### **Abstract**

In this talk, a Green’s basis and a new physical basis for dimension-seven (dim-7) operators are proposed, which are suitable for the matching of ultraviolet models onto the Standard Model Effective Field Theory (SMEFT) and the derivation of renormalization group equations (RGEs) for the SMEFT dim-7 operators. The reduction relations to convert operators in the Green’s basis to those in the physical basis are achieved as well, where some redundant dim-6 operators in the Green’s basis are involved if the dim-5 operator exists. Working in these two bases, we work out the one-loop RGEs resulting from the mixing among different dimensional operators for the SMEFT dim-7 operators for the first time, and also revisit those from the mixing among dim-7 operators. These results complete the full RGEs of dim-7 operators and can be used for a consistent one-loop analysis of the SMEFT. Some applications of those results are briefly discussed.

**Miércoles 23 de Octubre de 2024 a las 14:30 horas de Chile.**

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