

## Flavour Physics and Electroweak Symmetry Breaking

### *Research Project / Research Group Description:*

The discovery, at the LHC, of a scalar boson with the expected properties of the SM Higgs has opened new perspectives in the study of the dynamics associated to such scalar sector, and its possible extensions. In the near future, the LHC could reveal new degrees of freedom around or above the energy scale of 1 TeV, probably uncovering additional sources of flavour and CP violation. In parallel, there is an intense activity in flavour physics with several experiments currently running, or planned, around the world to measure the transitions from one flavour to another with high precision. These low-energy processes can indirectly reveal new particles and interactions through experimental deviations from the Standard Model predictions. In the framework of a possible discovery of new particles at the LHC, flavour physics would provide invaluable insight into their couplings and mixing patterns.

LHCPheno is a world-leading group in Particle Physics Phenomenology, working at IFIC, which collaborates with many other theoretical and experimental groups worldwide. Our main objective is the determination of the parameters of the Standard Theory with the highest possible precision, and the identification of possible signals of new physics beyond the present theoretical framework. Our research work is closely related with the present experimental situation in High Energy Physics and its expected evolution in the near future.

### *Job position description:*

The project aims to perform a detailed investigation of the implications of the electroweak spontaneous symmetry breaking, both at high energies and in flavour physics. Several extensions of the Standard Model scalar sector will be analysed and a comprehensive investigation of their phenomenological signals will be performed. Special attention will be given to the so-called flavour anomalies, uncovered by recent experimental measurements, which seem to indicate the presence of new flavour dynamics.

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Research project/Research Group website

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