Inertial types of elliptic curves defined over quadratic extensions of $\mathbb{Q}_p$

Jose Antonio Castro Moreno - joseantonio.castro@icmat.es

Associated with an elliptic curve E defined over a finite extension K of $\mathbb{Q}_p$ one can define the Weil-Deligne representation $\rho : \mathrm{W}(\overline{K}/K) \to \mathrm{GL}_2(\mathbb{C})$. The isomorphism class of ρ restricted to the inertia subgroup is called the inertial type of E. These inertial types play an important role in several topics that range for Diophantine applications to a proposed generalization of Maeda's conjecture by Dieulefait, Pacetti and Tsaknias. In a recent work, Dembélé-Freitas-Voight provided a complete classification and explicit description of all the possible inertial types for elliptic curves defined over $\mathbb{Q}_p$ for all p. In this talk we will present partial results towards a complete classification and description of the inertial types over quadratic extension of $\mathbb{Q}_p$, namely we discuss the case of unramified quadratic extensions of $\mathbb{Q}_p$ for $p > 2$. This is joint work with Nuno Freitas.