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**Jeonghun Kim\*** ([kim\\_j@math.lsu.edu](mailto:kim_j@math.lsu.edu)), Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803. *Arf equivalence classes of quadratic number fields.*

This talk will discuss the classification of quadratic fields up to “Arf equivalence”. Let  $K$  be a quadratic field. Let  $P$  be a place of  $K$ . Then the Hilbert symbol at  $P$  can be viewed as a bilinear form on the  $\mathbb{F}_2$  vector space of local square classes at  $P$ . According to a formula of Tate, the local root number function  $r_P$  is a multiplicative quadratic refinement of the local Hilbert symbol. Two quadratic fields  $K, L$  are called “Arf equivalent” when there is a bijection  $T$  of the places of  $K$  to the places of  $L$  so that the local root number function  $r_P$  is isometric to the local root number function  $r_{TP}$  for every  $P$ . [Two local root number functions are isometric if and only if the local square class groups have the same dimension over  $\mathbb{F}_2$ , the Hilbert symbols have the same type, and the local root number functions have equal Arf invariants.] A more descriptive but harder-to-pronounce name for “Arf equivalence” is “everywhere locally local root number isometric quadratic fields”. (Received September 08, 2006)