Boğaziçi
MATH COLLOQUIUM

Asymptotic Generalized Fermat's Last Theorem over Number Fields

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Abstract:

Recent work of Freitas and Siksek showed that an asymptotic version of Fermat's Last Theorem (FLT) holds for many totally real fields. This result was extended by Deconinck to the generalized Fermat equation of the form $Ax^p + By^p + Cz^p = 0$, where A, B, C are odd integers belonging to a totally real field. Later Şengün and Siksek showed that the asymptotic FLT holds over number fields assuming two standard modularity conjectures.

In this work, combining their techniques we show that the generalized Fermat's Last Theorem (GFLT) holds over number fields asymptotically assuming the standard conjectures. We also give three results which show the existence of families of number fields on which asymptotic versions of FLT or GFLT hold. In particular, we prove that the asymptotic GFLT holds for a set of imaginary quadratic number fields of density 5/6.

This is joint work with Ekin Özman.

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