ODTU-Bilkent Algebraic Geometry

Two kinds of real lines on real del Pezzo surfaces and invariance of their signed count

By

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Abstract: In his classical treatise on real cubic surfaces, Segre discovered two kinds of real lines which he called elliptic and hyperbolic.
His enumeration indicated that the number of hyperbolic is greater by 3 than the number of elliptic ones independently of a real structure on the cubic surface.
However this property did not receive a conceptual explanation until recently: in a joint work with V.Kharlamov we interpreted a signed count of lines as a signed count of zeroes of some vector field in a Grassmannian (and so, it is Euler's number of the corresponding vector bundle).
In the current work that I will present, we develop an alternative approach to counting lines on real del Pezzo surfaces X of degrees 1 and 2 (a projective plane blown up at 8 or 7 generic points, respectively). The two types of real lines are distinguished by certain canonical Pin-structure on the real locus X_R (this looks different from the approach of Segre, but is equivalent to it in the case of cubic surfaces).
A signed count of real lines is interpreted as some lattice root enumeration, which lets us prove our invariance properties for del Pezzo of degree 1 and 2, like in the case of cubic surfaces.

Date: 5 November 2021, Friday
Time: 15:40 (GMT+3)
Place: Zoom

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