Colloquium del Departamento de Análisis Matemático

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"Hyperplane inequalities for measures of convex bodies"

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Abstract:

The hyperplane problem asks whether there exists an absolute constant C so that every origin-symmetric convex body of volume 1 in R^n has a central hyperplane section with $(n-1)$-dimensional volume greater than $1/C$. The problem is still open. The best-to-date estimate $C \sim n^{1/4}$ was established by Klartag who removed a logarithmic term from an earlier estimate of Bourgain. The answer is known to be affirmative for some special classes of convex bodies – unconditional bodies, zonoids, subspaces of L_p, intersection bodies and others. In this talk we show that for many of these classes the hyperplane problem has affirmative answer with arbitrary measure in place of volume. We also show that the hyperplane inequality holds with $C = 2n^{1/2}$ for any measure with continuous density and any origin-symmetric convex body in R^n.