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Abstracts of Short Communications and Posters

Section:

5. Differential Geometry and Global Analysis

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Sedykh, Vyacheslav D., Gubkin Academy of Oil and Gas, Moscow, Russia:

On classes of convex curves in projective spaces.

A smooth (C^∞-embedded) closed curve in $\mathbb{R}P^{n+1}$ is called *convex* if every hyperplane $\mathbb{R}P^n$ intersects it at most at $n+1$ points (taking the multiplicities into account). The curve is called *convex by Barner* if for every its n points (which are not necessary geometrically-different) there exists a hyperplane through these points that does not intersect the curve anymore.

A curve in $\mathbb{R}P^{n+1}$ having a convex projection to a hyperplane $\mathbb{R}P^n$ from a point (outside of the curve) is convex by Barner. The natural question (V. Arnold, 1996): what is the relation between these two classes of curves? The answer is the following:

Theorem. *There is an open set (in C^∞-topology) of smooth closed curves in $\mathbb{R}P^{n+1}$, which are convex by Barner and have no convex projections to any hyperplane.*