Elliptic Sections of a Convex Body

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Let D be a convex body in $\mathbb{E}^3$. It is well known that D has to be an ellipsoid if all the sections by planes that meet in a fixed point are elliptic. We study similar results but restricting the number of planes. For example, we proof that D is an ellipsoid if any of the following properties holds:

1. D has elliptic and homothetic sections parallel to two planes.
2. D is centrally symmetric and has elliptic sections parallel to three planes.
3. There exit two lines (one of them with interior points of D) such that the sections of D defined by planes that contain any of the lines are elliptic.

We give some relevant counterexamples and extend the above characterizations to dimension $d \geq 3$.