On uniform rotundity in every direction in Calderón-Lozanovskiĭ sequence spaces

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We find a criterion for uniform rotundity in every direction ($URED$) of Calderón-Lozanovskiĭ sequence spaces solving Problem XII from [1]. In order to do it, we study properties of the directed modulus of convexity of Banach spaces. Next we introduce and study new notions such as uniform rotundity in every interval ($UREI$) and uniform monotonicity in every interval ($UMEI$). They are crucial to get the main criterion, that is a Köthe sequence space is $UREI$ iff it is $URED$ and order continuous. Then we show the important (for further investigations) characterization of the property $UREI$ on the positive cone of Köthe sequence space. Applying this, we characterize Calderón-Lozanovskiĭ sequence spaces that are uniformly rotund in every direction. As a corollary, we obtain the criterion for uniform rotundity in every direction of Orlicz-Lorentz sequence spaces.

References

[1] S. Chen, Y. Cui, H. Hudzik and T. Wang, *On some solved and unsolved problems in geometry of certain classes of Banach function spaces*, Unsolved Problems on Mathematics for the 21st Century, J. M. Abe&Tanaka (Eds.) IOS Press 2001.

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