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Igor G Nikolaev* (inik@math.uiuc.edu), University of Illinois at Urbana-Champaign, 273
Altgeld Hall, 1409 West Green Street, Urbana, IL 61801. *Quasilinearization, Euler's inequality and
Aleksandrov's curvature.*

This is a joint work with I.D. Berg. We characterize Aleksandrov \mathfrak{R}_0 domains (also known as CAT(0) spaces) by introducing a *quasilinearization* for an abstract metric space via the notion of the quadrilateral cosine, cosq , and by employing an analogy between quasilinearization and some characteristic properties of inner product spaces. One of our main results states that a geodesically connected metric space (\mathcal{M}, ρ) is an \mathfrak{R}_0 domain if and only if, for every quadruple of points $\{A, B, C, D\} \subset \mathcal{M}$, the following metric analogue of Euler's inequality (also known as Enflo's 2-roundness condition) holds: $AC^2 + BD^2 \leq AB^2 + BC^2 + CD^2 + AD^2$. In particular, our results give a complete solution to the Gromov curvature problem in the context of metric spaces of non-positive curvature. (Received January 29, 2009)