1145-42-2156 **Michael Christ***, Department of Mathematics, University of California, Berkeley, CA 94708, and **Dominique Maldague**. *A symmetrization inequality shorn of symmetry.* Preliminary report.

An inequality of Brascamp-Lieb-Luttinger and Rogers concerns functionals $\int_{R^D} \prod_{j\in J} \mathbf{1}_{E_j}(L_j(x))\,dx$ where $E_j \subset R^d$ and $L_j : R^D \to R^d$ are surjective linear mappings. If D is a multiple of d and if there is a diagonal action of $O(d)$ that is a symmetry of the functional, the inequality states that among sets of specified Lebesgue measures, the functional attains its maximum value when E_j are balls centered at the origin.

We investigate a more general class of tuples of linear mappings L_j, with $d = 2$, for which the symmetry hypothesis does not hold. A definition of admissibility is formulated. Maximizing tuples that are Steiner symmetric with respect to both coordinate axes with respect are shown to exist. When the mappings are small perturbations of a tuple satisfying the symmetry hypothesis, such Steiner symmetric maximizers are shown to be domains with smooth boundaries, and to be small perturbations of ellipsoids. The proof of smoothness might be described as a bootsrapping argument for a coupled system of free boundary problems. (Received September 24, 2018)