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On Bonnesen-style symmetric mixed isothothetic inequalities

We investigate the translative containment measure of a convex domain to contain, or to be contained in, the homothetic copy of another convex domain. That is, given convex domains K_0, K_1 of areas A_0, A_1 , respectively, in the Euclidean plane \mathbb{R}^2 , is there a translation T so that $t(TK_1) \subset K_0$ or $t(TK_1) \supset K_0$ for $t > 0$? Via the translative kinematic formulas of Poincaré and Blaschke in integral geometry, we estimate the symmetric mixed isothothetic deficit $\sigma_2(K_0, K_1) \equiv A_{01}^2 - A_0A_1$, where A_{01} is the mixed area of K_0 and K_1 . We obtain a sufficient condition for K_0 to contain, or to be contained in, $t(TK_1)$. By this condition, we obtain the known Minkowski isothothetic inequality, some Bonnesen-style symmetric mixed isothothetic inequalities and reverse Bonnesen-style symmetric mixed isothothetic inequalities. These symmetric mixed isothothetic inequalities obtained are known Bonnesen-style isoperimetric inequalities and reverse Bonnesen-style isoperimetric inequalities if one of domains is a disc.