

Abstract: Three different Willmore flows, and the most useful variant is supercritical

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We are going to address **life-span estimates, characterizability of singularities** and **concrete detection of divergent flow lines** of the classical Willmore flow and of two further types of Willmore flows. In order to thoroughly understand this technical topic we are going to firstly recall several early key-results concerning the classical and inverse Willmore flow, and then we will move on to the much more challenging **Möbius-invariant Willmore flow** - a geometric flow of 4th order whose behaviour turned out to be far more complicated in spite of its useful geometric property to be **conformally invariant**. We will finally discuss: why the latter flow indeed produces divergent flow lines, how one can actually detect them and why this discovery strongly hints at **a supercritical behaviour** of the Möbius-invariant Willmore flow.