

Blow-ups and blow-downs of Lagrangian submanifolds and real symplectic packing

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Abstract

We construct the symplectic blow-up and blow-down in a symplectic manifold (M, ω) relative to a Lagrangian submanifold $L \hookrightarrow M$. For a symplectic four manifold with a real structure, i.e. an involution $\phi : M \rightarrow M$ with $\phi^*\omega = -\omega$, we derive a homological condition which determines when the topology of the fixed point set, $\text{Fix}(\phi)$, changes after a blow down, and we use these results to study real symplectic ball packings in $(\mathbb{C}P^2, \mathbb{R}P^2)$.