

Anti-self-dual instantons and codimension-1 collapse

Lorenzo Foscolo

We study the behaviour of anti-self-dual instantons on $\mathbb{R}^3 \times S^1$ (also known as calorons) under codimension-1 collapse, i.e. when the circle factor shrinks to zero length. In this limit, the instanton equation reduces to the well-known Bogomolny equation of magnetic monopoles on \mathbb{R}^3 . However, inspired by work of Kraan and van Baal in the mathematical physics literature, we show how $SU(2)$ instantons can be realised as superpositions of monopoles and "rotated monopoles" glued into a singular background abelian configuration consisting of Dirac monopoles of positive and negative charges. I will then discuss (potential) applications of this construction to moduli spaces of instantons on more general ALF spaces. The moduli spaces are themselves (mildly singular) hyperkähler spaces with an interesting QALF asymptotic geometry. This is joint work with Calum Ross.