

Biquaternion Construction of Non-Compact $SL(2, \mathbb{C})$ Yang–Mills Instantons

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We extend quaternion calculation in the ADHM construction of $Sp(1)$ ($= SU(2)$) self-dual Yang–Mills instantons to the case of biquaternion. We use the biconjugate operation to construct the non-compact $SL(2, \mathbb{C})$ k -instantons. The number of moduli for $SL(2, \mathbb{C})$ k -instantons is found to be twice of that of $Sp(1)$, $16k - 6$. The structures of singularities or jumping lines of the complete $SL(2, \mathbb{C})$ $k = 1, 2, 3$ instantons with 10, 26, 42 moduli parameters are particularly investigated.