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SU(N) fractional instantons

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We present our ongoing study of a set of solutions to the $SU(N)$ Yang-Mills equations of motion with fractional topological charge. The configurations are obtained numerically by minimising the action with gradient flow techniques on a torus of size $l^2 \times \tilde{l}^2$ (with $\tilde{l} \equiv Nl$) and twisted boundary conditions. We pay special attention to the large N limit, which is taken along a very peculiar sequence, with the number of colours N and the magnetic flux m selected respectively as the n and (n-2) terms of the Fibonacci sequence. We discuss the large N scaling of the solutions and analyze several gauge invariant quantities as the Polyakov and Wilson loops. We also discuss the Hamiltonian limit, with one of the large directions sent to infinity, where these instantons represent tunnelling events between inequivalent pure gauge configurations.

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