Dual Superconductivity in G_2 group

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Abstract: We investigate the dual superconductivity mechanism in the exceptional group G_2. This is a centerless group (no 't Hooft flux vortices are allowed) and we check for the presence of a magnetic monopole condensate in the confined phase by measuring on the lattice a disorder parameter related to the vacuum expectation value of an operator carrying magnetic charge. The behaviour of the disorder parameter is consistent with the dual superconductor picture. By performing a scaling analysis of the Polyakov loop susceptibility we find evidence of a first order confinement–deconfinement transition at finite temperature. A similar analysis is conducted for the disorder parameter.