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Monogamy of quantum steering ANTONY MILNE, DAVID JENNINGS, Imperial College London, SANIA JEVTIC, Brunel University, TERRY RUDOLPH, Imperial College London, HOWARD WISEMAN, Griffith University — The quantum steering ellipsoid formalism naturally extends the Bloch vector picture for qubits to provide a visualisation of two-qubit systems. If Alice and Bob share a correlated state then a local measurement by Bob steers Alices qubit inside the Bloch sphere; given all possible measurements by Bob, the set of states to which Alice can be steered form her steering ellipsoid. We apply the formalism to a three-party scenario and find that steering ellipsoid volumes obey a simple monogamy relation. This gives us a novel derivation of the well-known CKW (Coffman-Kundu-Wootters) inequality for entanglement monogamy. The geometric perspective also identifies a new measure of quantum correlation, 'obesity', and a set of 'maximally obese' states that saturate the steering monogamy bound. These states are found to have extremal quantum correlation properties that are significant in the steering ellipsoid picture and for the study of two-qubit states in general.

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