Hyperentanglement-assisted Bell-state analysis
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abstract We propose a simple scheme for complete Bell-state measurement of photons using hyper-
entangled states - entangled in multiple degrees of freedom. In addition to hyperentanglement, our scheme
requires only linear optics and single photon detectors, and is realizable with current technology. At the
cost of additional classical communication, our Bell-state measurement can be implemented non-locally. We
discuss the possible application of these results to quantum dense coding and quantum teleportation.