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Comparisons of entanglement witnesses for n-qubit systems RICHARD BONDE, ANDREW SCHAUF, ELIZABETH BEHRMAN, Department of Physics, Wichita State University — An overlooked problem in witness design is the possibility of phase offset contamination. For example, the singlet EPS 2-qubit state $\frac{1}{\sqrt{2}}(|\uparrow\downarrow\rangle - |\downarrow\uparrow\rangle)$differs from $\frac{1}{\sqrt{2}}(|\uparrow\downarrow\rangle + |\downarrow\uparrow\rangle)$only by a relative phase factor of $e^{i\pi}$, yet both states are fully entangled. We compare in detail several published witnesses on entangled pure and mixed systems with varying degrees of phase offset.

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