N-representability is QMA-complete

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We study the computational complexity of the N-representability problem in quantum chemistry. We show that this problem is QMA-complete, which is the quantum generalization of NP-complete. Our proof uses a simple mapping from spin systems to fermionic systems, as well as a convex optimization technique that reduces the problem of finding ground states to N-representability.

This is joint work with Y.-K. Liu and F. Verstraete