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A multiversion of real and complex hypercontractivity.

We establish a multiversion of real and complex Gaussian hypercontractivity. Our result generalizes Nelson's hypercontractivity in the real setting and the works of Beckner, Weissler, Janson, and Epperson in the complex setting to several functions. The proof relies on heat semigroup methods, where we construct an interpolation map that connects the inequality at the endpoints. As a consequence, we derive sharp multiversion of the Hausdorff-Young inequality and the log-Sobolev inequality. This is joint work with Paata Ivanisvili.