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Measurements confirm a thermodynamical theory for convective vortices

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Convective vortices are ubiquitous on Earth, Mars, Venus, Jupiter, and other planetary bodies. They are significant contributors to the dust budget of the atmospheres of Earth and Mars, besides being among the most hazardous natural phenomena on Earth. Understanding the basic physics of these vortices allows better predictions of their behavior. Here we report that measurements of unprecedented accuracy on a dust devil– the most readily available convective vortex for safe in-situ measurements– proves the validity of a generalized version of Bernoulli equation applicable to convective flows. This is important because the equation sheds new light into the basic features of convective vortices and their relationship with climate.