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*Finite-time singularity formation for De Gregorio's model of the three-dimensional vorticity equation.*

We discuss a proof of singularity formation for De Gregorio's model of the three dimensional vorticity equation. We explain the three main parts of the proof:

- (1) Understanding the interaction between vortex stretching and advection and how one could (heuristically) win over the other.
- (2) Considering self-similar solutions to the equation without advection and formally perturbing them to get solutions to the (full) equation with advection.
- (3) A good understanding of how the Hilbert transform behaves in certain settings. (Received March 10, 2017)