Connecting curves for dynamical systems

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We introduce one dimensional sets to help describe and constrain the integral curves of an n dimensional dynamical system. These curves provide more information about the system than the zero-dimensional sets (fixed points) do. In fact, these curves pass through the fixed points. Connecting curves are introduced using two different but equivalent definitions, one from dynamical systems theory, the other from differential geometry. We describe how to compute these curves and illustrate their properties by showing the connecting curves for a number of dynamical systems. If one can determine the vector field associated with a flow, then our algorithm can be applied to locate vortex filaments. These lines define regions around which the flow circulates.