Motion of unstable polygonal ring of vortex points on sphere with pole vortices TAKASHI SAKAJO, Hokkaido University — We consider the motion of the N-vortex points that are equally spaced along a line of latitude on sphere with fixed pole vortices, which is called the polygonal N-ring configuration. We are interested in not only the linear stability, but also the long time evolution of the unstable N-ring. In this talk, starting with the linear stability analysis, we characterize the eigenvectors and their corresponding eigenvectors. Then based on the linear stability result, we propose a projection method that reduce the whole system to low-dimensional invariant dynamical system with some symmetry. Thus applying the method to the even vortex points and the 3-ring cases, we show the existence of the heteroclinic and the homoclinic orbits embedded in the high-dimensional phase space. We also discuss the transition of the topology of these invariatnt structures when the strengths of the pole vortices change.

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