1145-D1-2494 **Faina Berezovskaya*** (fberezovskaya@howard.edu), Howard University, Washington, DC 20059, and **Georgiy Karev**. *Arnold's weak resonance equation in modeling of Greek ornamental design.*

We consider a complex differential equation that describes a vector field invariant with respect to rotation to the angle $2\pi/n$ that was proposed by V. Arnold (1983) as a model of the loss of stability of self-sustained oscillations. Cases for "strong resonance" were discussed in many works. Here, we study the cases of "weak resonance". The equation is Hamiltonian at some values of parameters; its equilibria are saddles and centers. Due to the symmetry the saddles create n-separatrix cycles and the centers create n-center rings. We show that the equation demonstrates different kinds of phase behaviors depending on whether n is even or odd. Phase portraits of the equation have patterns that mimic the qualitative features of some of Greek ornamental designs that one can see in historical museums of Crete and Athens. We analyze the role of equation parameters in the genesis of patterns and repeated designs for different n and discuss approaches to modeling these designs. (Received September 25, 2018)