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A gradient method for detecting stable configurations of point vortices MAKOTO UMEKI, Dept. of Phys. Univ. of Tokyo — A Hamiltonian H of point vortices can be given by a sum of functions of relative positions of all pairs of vortices. For square periodic boundary conditions, the function has a minimum at the position the most away. Therefore, if we consider the gradient system corresponding to the Hamiltonian system, it should settle down into a stable configuration which gives the local minimum of H. Numerical examples of tens to a hundred of periodic vortices show patterns very close to triangles. This method is not only applicable to the system of point vortices but also many kinds of problems of optimization. Its relation to trianglar vortex patterns observed in Bose-Einstein condensates of superfluids will be discussed.

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