1099-53-116   **Weiyong He*** (`whe@uoregon.edu`), Department of Math, University of Oregon, Eugene, OR 97403. *Kahler-Ricci soliton and H-functional.*

We consider Kahler-Ricci solitons on a Fano manifold M. We introduce an H-functional on M; we show that its critical point has to a Kahler-Ricci soliton and the Kahler-Ricci flow can be viewed as its reduced gradient ow. We then obtain a natural lower bound of H-functional in terms of an invariant of holomorphic vector elds on M. As an application, we prove that a Kahler-Ricci soliton, if exists, maximizes Perelman's μ-functional. Second we consider a conjecture proposed by S.K. Donaldson regarding the existence of Kahler metrics with constant scalar curvature in terms of K-energy; a simple observation is that on Fano manifolds, one can consider Donaldson's conjecture in terms of Ding's F-functional. We then state geodesic stability conjecture on Fano manifolds in terms of F-functional. Similar pictures can be naturally extended to Kahler-Ricci soliton and modi ed F-functional. (Received February 03, 2014)