

SELF-DUAL EQUATIONS ON RIEMANN SURFACE

ABSTRACT. In this seminar, we are trying to learn basic topics on Higgs bundles, and mainly focus on the relations between Hermitian-Yang-Mills equation and slope stability. The main reference is Hitchin's celebrated paper [\[Hit87\]](#).

0. SCHEDULE

- 0.1. **Talk 1: Preliminaries on differential geometry (Qiliang Luo 02/27).**
 - Principal bundle;
 - Connection, curvature of principal bundle.
- 0.2. **Talk 2: Self-dual equations (Qiliang Luo 03/06).**
 - The definition of self-dual equations on principal bundle;
 - The existence of solution to self-dual equation implies the stability.
- 0.3. **Talk 3: Stability of rank two Higgs bundles I (Bowen Liu 03/12).**
 - General theory about slope stability;
 - Classifications of rank two stable Higgs bundles over projective line and elliptic curve.
- 0.4. **Talk 4: Stability of rank two Higgs bundles II (Bowen Liu 03/27).**
 - Descriptions of rank two stable Higgs bundles over curves of general type.
- 0.5. **Talk 5: Stability of rank two Higgs bundles III (Baiting Xie 04/02).**
 - General criterion for rank two vector bundles over curves of general type to occur in stable pairs.

REFERENCES

- [Hit87] N. J. Hitchin. The self-duality equations on a Riemann surface. *Proc. London Math. Soc. (3)*, 55(1):59–126, 1987.