HIGGS BUNDLES AND RELATED TOPICS

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. **Lecture 1: Preliminaries on differential geometry (02/27).**
- Principal bundle;
- Connection, curvature of principal bundle;

0.2. **Lecture 2: Self-dual equations (Baiting Xie).**
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0.3. **Lecture 3: Vanishing theorem (Qiliang Luo).**
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0.4. **Lecture 4: Stability of rank two Higgs bundles (Bowen Liu).**
- Rank two stable Higgs bundles over projective line and elliptic curve;
- Rank two stable Higgs bundles over curves of general type;
- Endomorphism of stable Higgs bundles;
- Remarks on higher ranks and positive characteristic case.

0.5. **Lecture 4: An existence theorem.**
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REFERENCES

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