西 北 大 学

非线性科学研究中心综合报告会

From the B-Toda to the BKP hierarchy

报告人： 谢远成

报告时间： 2023 年 4 月 5 日 上午 11:00-12:00

报告地点： 长安校区东学楼二层凌岭报告厅（0216）

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报告摘要 In this talk we will show that all τ-functions of BKP hierarchy can be written as Pfaffians of skew-symmetric matrices. τ-functions of BKP hierarchy are parameterized by points in the universal orthogonal Grassmannian manifold (UOGM). The UOGM is a disjoint union of Schubert cells, we classify and give explicit parameterization for points in each Schubert cell by constructing a frame for UOGM in the sense of Sato. τ-functions arethen expressed in terms of these frames and Schur-Q functions. For concreteness we give a comprehensive study for the τ-functions of B-Toda which can be viewed as a finite version of the BKP hierarchy. Along the way we also give a constructive description for complex pure spinors du E. Cartan. As an application of our construction, we reprove a theorem due to A. Alexandrov which states that τ-functions of KdV satisfy BKP up to rescaling of the time parameters by 2. We prove this by showing that the KdV hierarchy can be viewed as 4-reduction of the BKP hierarchy. This interpretation gives complete characterization for the KdV orbits inside the BKP hierarchy. Other than a few facts from representation theory, the main tools we use to show the above results, however, are surprisingly simple linear algebra. This talk is based on a recent preprint arXiv:2210.03307.

报告人简介： 谢远成，北京国际数学研究中心的博士后，在 Yuji Kodama 教授的指导下于 2021 年从美国俄亥俄州立大学取得博士学位。他目前的主要兴趣在研究与可积系统相关的代数与几何。

邀请人： 黄晴、康静

欢迎各位老师和同学踊跃参加！

西北大学数学学院 非线性科学研究中心

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