



复旦大学数学科学学院 数学综合报告会

报告题目：On the cohomology ring of the Bott—Samelson variety

报告人：Tao Gui (Beijing International Center for Mathematical Research)

时间：2025-03-18 星期二 16:00-17:00

地点：光华东主楼1801

报告摘要：

We study the cohomology ring of the Bott--Samelson varieties, which are useful in studying the topology of compact Lie groups and constructing resolutions of Schubert varieties. We compute an explicit presentation of this ring via Soergel's result, which implies that it is a combinatorial invariant. We prove that it is a Koszul algebra and we provide a quadratic (reduced) Gröbner basis. Furthermore, we prove that it satisfies the whole Kähler package, including the Poincaré duality, the hard Lefschetz theorem, and the Hodge--Riemann bilinear relations. I will also discuss an open question on the isomorphism problem on Bott—Samelson varieties. This is the product of a project of the PACE 2024 program (a research experience for undergraduates) at Peking University, joint with Lin Sun (Fudan University), Shihao Wang (Tsinghua University) and Haoyu Zhu (Sun Yat-sen University).

非线性数学模型与方法教育部重点实验室
中法应用数学国际联合实验室
上海市现代应用数学重点实验室
复旦大学数学研究所