



Contribution ID: 211 Contribution code: ACS-5

Type: **Oral Presentation**

81Kr dating with 1 kg of polar ice

Tuesday, 22 October 2024 16:10 (20 minutes)

81Kr is a cosmogenic isotope with half-life of 229 ka. Its dating range is 20-1500 ka, which covers many applications for polar ice. 81Kr can provide absolute, radiometric ages and do not rely on continuous stratigraphy. Thus it is complementary to conventional ice dating techniques and is particularly valuable for disturbed ice samples. 81Kr-dating on 200 kg blue ice samples from the Taylor Glacier has been demonstrated in 2014, using the Atom Trap Trace Analysis (ATTA) method. Over the past decade, there has been continuous efforts to reduce the sample size so that 81Kr-dating can be applied on deep ice cores, especially the stratigraphically disturbed ones. In this talk, I will present some of our works along this journey and report our recent technical breakthrough on the all-optical ATTA method. By using the optical excitation scheme in ATTA, the memory effect is significantly suppressed, allowing us to reduce the sample size to 1 kg. The performance of the new all-optical ATTA dating method has been verified with ice core samples from Taylor glacier. Recently we have performed 81Kr-dating on the bottom ice from the GISP2 site in Greenland. The results may shed light on the evolution history and stability of the Greenland ice sheet.

Student Submission

No

Primary authors: WANG, Jie (University of Science and Technology of China); FENG, Xin (University of Science and Technology of China); Prof. JIANG, Wei (中国科学技术大学); LIN, Qiao-Song (CAS Dalian Institute of Chemical Physics); LU, Zheng-Tian (University of Science and Technology of China); RITTERBUSCH, Florian (University of Science and Technology of China); YANG, Guo-Min (University of Science and Technology of China)

Presenter: Prof. JIANG, Wei (中国科学技术大学)

Session Classification: Applications in Climate Studies

Track Classification: Applications in Climate Studies