



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 3504

Type: **not specified**

Energy Management and Mine Cooling via Cryogenics

Tuesday 7 June 2022 13:15 (30 minutes)

Mining is at the fundamental base of the technologies needed to manage Climate Change; Canada has recently recognised the importance of implementing a critical metals strategy to secure the future. As we search for more metals we are going deeper, at depths of 2000 m or more the current chilling systems are no longer efficient or even capable of providing the needed chilling. Cryogenic liquids are an energy storage vector that can convert the heat of the mine to electricity and has the unique feature of being a pumped liquid; therefore, chilling can be delivered to the zone where it is needed without having to chill the entire mine air supply. We will present results from our latest test in a real mine setting, which elevates the TRL level from 5 to 7, and outline plans for a large scale test in the next phase of development on the pathway to commercialisation. The presentation will outline the physical mechanisms of cryogenic chilling and energy storage, provide results of measurements during the real time test and include a short video of duration 4:20.

Co-authors: CLUFF, Daniel (University of Exeter); SENGUPTA, Sujit

Presenters: CLUFF, Daniel (University of Exeter); SENGUPTA, Sujit

Session Classification: T3-5 Private Sector Physicists (CAP-DAPI) | Physicien(ne)s dans le secteur privé (ACP-DPAI)