

Groundwater and crack behaviors after underground gallery closure inferred from observation of S-wave travel time change by the seismic ACROSS

\*Takahiro Kunitomo<sup>1,2</sup>, Koshun Yamaoka<sup>1</sup>, Hiroshi Ishii<sup>2</sup>, Yasuhiro Asai<sup>2</sup>, Toshiki Watanabe<sup>3</sup>

1.Graduate School of Environmental Studies, Nagoya University, 2.Tono Research Institute of Earthquake Science, ADEP, 3.Earthquake Research Institute,The University of Tokyo

Constant monitoring of temporal seismic velocity change by the seismic ACROSS has been practiced for more than 13 years since 2002 at Tono mine (Toki City, Gifu Prefecture). At Tono mine, back-filling of underground galleries were started from March 2012 and completed in March 2015. The drainage pump stopped on December 9, 2014. In this study, we report the significant changes of the S-wave travel time associated with reflood of the underground galleries. In addition, we conclude that S-wave velocity change has occurred in the Toki granite under sedimentary formation ( Mizunami Group, about 90m thick), and discuss that groundwater flow in and around the packed gallery control the opening and closing of cracks and the S-wave velocity change.

Keywords: seismic ACROSS, Tono mine, reflood, seismic velocity change