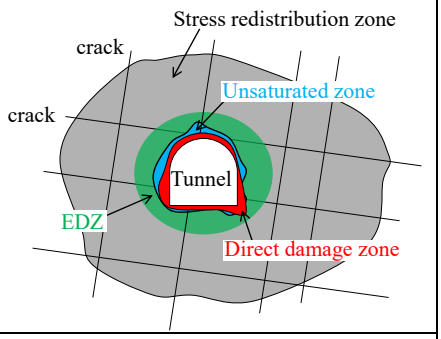
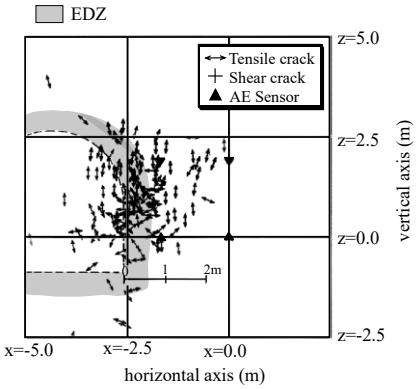
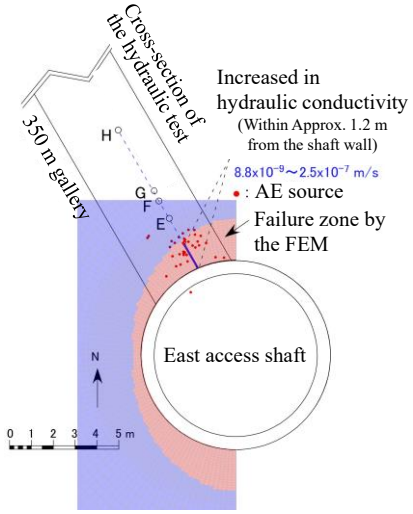
Evaluation of the EDZ using the AE Method

Keywords	Loose zone, EDZ, AE, optical AE, multi measurement probe	
Technology overview	Acoustic emission can detect changes and damage within materials. This technology is used to evaluate the excavation damaged zone (EDZ) following the excavation of underground caverns. It can also be utilized for maintenance and monitoring after the completion of underground caverns.	The Concept of EDZ: 
Applications	• Optimal length of tunnel rock bolts • Assessment of rock mass integrity and stability • Monitoring of tunnel instability and rock bursts • Long-term management following completion of excavation	
Know-how	Elastic Wave Attenuation in the Rock Mass Under Measurement Noise Reduction (Excavation Machinery, Compressors, etc)	
Patent*	Japan_No.5223622, No.5350999, No.5584973, No.6216520	
Related technologies	Strain measurement, stress measurement, etc.	
Examples	I. Hard rock formation 1_ gneiss (Mine): 1 2_ Granite (mine): 1[*1] 3_ Granite (underground storage): 2 II. Soft rock formation 1_ Siliceous mudstone (URL): 1[*2] Example of EDZ Evaluation Using AE (Moment Tensor Analysis) [*1] 	Example of EDZ Evaluation Using Optical AE[*2]  Comparison of Measurement and FEM Analysis

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