

3 PUBLISHABLE ABSTRACTS OF FUNDED PROJECTS

Following tables are public and available on the ERA-MIN 2 web site in the «News» menu, in the document "Publishable abstracts of the 12 projects funded under ERA-MIN Joint Call 2018". They can also be accessed through the « Call Results » menu.

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| Project acronym | MIWACUT | | |
| Project title | Investigating the microwave assisted cutting of carbonate rocks | | |
| Main topic | 1. Supply of raw materials from exploration and mining | | |
| Sub-topics | 1.2 Mining operations | | |
| Keywords | Carbonate rocks, microwave assisted cutting, specific energy, numerical modelling | | |
| Publishable abstract | <p>In order to make the excavation of hard rocks possible by mechanical excavators except the tunnel boring machines (TBM) or to increase cutting rate and decrease wear rate during cutting very hard rocks, recently, the research on some innovative methods such as microwave assisted (MWA) rock cutting have been drawing attention. However, there is no currently MWA cutting machine used in the laboratory or in the field. In this study, the cuttability of carbonate rocks by an integrated MWA linear cutting machine will be investigated. Carbonate rocks are excavated by drilling and blasting that is a challenging method compared to the mechanical excavation. However, the mechanical excavation of carbonate rocks is generally impossible or inefficient. The objective of this proposal is to reveal the cuttability of carbonate rocks by MWA-continuous miners (CMs). The linear cutting tests without and with microwave assistance will be carried out on the samples from Turkey and Romania and the specific energy values will be determined. The performances of CMs will be estimated using the specific energy and discontinuity properties for without and with microwave assisted cutting conditions, and the results will be compared. Finally, the excavation cost will be calculated for CM without and with microwave assistance and compared to the current drilling and blasting method. The partners of the proposal consist of one corporation and four engineering disciplines such as Mining Engineering, Mechanical Engineering, Geological Engineering, and Electrical and Electronic Engineering.</p> <p>After successfully completing the project, the suitability and the eco-efficiency of the MWA-CMs will be proven for the excavation of carbonate rocks. Using the MWA-CMs for the excavation of carbonate rocks will increase the efficiency and decrease the crushing and grinding costs. The environmental problems of blasting will disappear when using the MWA-CMs.</p> | | |
| Participating organisations | Hacettepe University (Turkey) University of Petrosani (Romania) University of Ankara (Turkey) PAMUKKALE UNIVERSITY (Turkey) Nigde Omer Halisdemir University (Turkey) KEMPAR Ltd. (Turkey) | | |
| Project duration | 36 months | | |
| Total Costs | 271.650 € | Total Requested Funding | 182.300 € |

