



Evolution of the volcanic arc on Flores Island, Indonesia, and its implication to geothermal resources

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The Sunda-Banda Arc is a volcanic arc that located in Indonesia from the island of Sumatra to the islands of Buru and Seram in the northern part of the Banda Sea. This arc is formed by the subduction of the Indo-Australian plate beneath the Eurasia plate. The interaction between these two plates is convergence where the Australian continental plateau enters the subduction. Flores Island, our main area of interest, is part of the Sunda-Banda Arc that is located at the transition of the subduction of the Oceanic Crust and the collision of the Continental Crust. As a volcanic island, Flores has mostly been built by volcanic activity that have migrated from north to south in the last 7 Ma, in contrast with the general volcanism of the Sunda-Banda Arc that has migrated northward. The focus of this work is the volcanic history of Flores Island, and surrounding, based on the available data and together with geochemical evidences, kinematic movement, and tomography studies. We propose a new interpretation of the origin of Flores Island based on K-Ar dating. The magmatic activity in Flores Island can be defined into two main periods, the Oligocene-Late Miocene and Pliocene-recent with short hiatus in between. In the western half of Flores, the Oligocene-Late Miocene volcanism was formed in an extensional regime due to the opening of Flores basin and Savu basin, with the occurrence of volcanism mainly in northern part of Flores Island. The Pliocene to recent volcanism was formed in compressional regime due to the Indo-Australian continental crust collision, which distributed to the south of the previous period in the western half of the island. In the eastern half of the Island the volcanism has not be shifted. Based on these evidences, the geothermal occurrences, related to volcanic and tectonic activity, show some clear differences in the east and the west of the island of Flores with a more complex history to the west. Also the volcanic edifices of Flores have the shortest spacing (21km in average) in the whole Sunda-Banda arc, making it attractive for geothermal energy development.