Statistical analysis of the columnar joints shape and study of its formation factor using high resolution 3D model by multicopter photos

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By the drone, we took the aerial photograph of the columnar joints outcropped on the coast of Tsumekizaki in Shimoda city, Izu Peninsula, and analyzed the statistical distribution of the columnar joint forms. In addition, we analyzed the varying factors by columnar joint using starch experiment and by the columnar joint simulation based on random points as contraction centers. According to the data of Tsumekizaki, the number of hexagons is the largest, followed by the number of pentagons and heptagons. the starch experiment, the number of hexagon was the largest, and the distribution was such that there were more pentagon and heptagons than the distribution of the columnar joints of Tsumekizaki. The columnar joints with random points were distributed from triangle to hendecagon, and had the less hexagons than that of Tumekizaki. In the ideal cooling, which is a case where the columnar joints were based on the contraction centers arranged at equal intervals, it becomes all hexagons. But, in the case of the random point columnar joints, the shapes other than hexagon increase. Accordingly, it is considered that the form variation of the columnar joint is related to the heterogeneity of cooling.

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