

月のシュレーター谷の形成年代の推定

Age estimation of the formation of the Vallis Schroteri

本田 親寿^{1*}, 渡口昌³, 諸田智克², 平田成¹, 出村裕英¹, 北里宏平¹, 小川佳子¹, 浅田智朗³, 春山純一²

Chikatoshi Honda^{1*}, Masashi Toguchi³, Tomokatsu Morota², Naru Hirata¹, Hirohide Demura¹, Kouhei Kitazato¹, Yoshiko Ogawa¹, Noriaki Asada³, Junichi Haruyama²

¹会津大学先端情報科学研究センター, ²会津大学, ³宇宙航空研究開発機構

¹CAIST/ARC-Space, Univ. of Aizu, ²Univ. of Aizu, ³Japan Aerospace Exploration Agency

The Vallis Schroteri on the Aristarchus Plateau on the Moon is a meandering negative depression, as called a sinuous rille. The Vallis Schroteri located at 26.2 N deg. in latitude and 50.8 W deg. in longitude. This is the largest sinuous rille on the moon, which is 168 km in length, 6 km in width, and 500 m on average in depth (less than 1 km) [Honda et al., 2009]. The sinuous rille has been suggested that the negative depression was produced by an ancient huge lava flow which eroded into the substrate ground. The volume of lava flow to produce the negative depression seemed to be the largest among volcanisms on the Moon. However, an age of this volcanic event is not estimated yet. Therefore, it is important to estimate the formation age of the Vallis Schroteri for understanding of thermal evolution of the moon.

We utilize the crater chronology method using the crater size-frequency distribution for the age estimation of the sinuous rille, because the ability of suitable high resolution images of Kaguya/TC lead us to measure a diameter of crater in the sinuous rille. We should remove secondary craters from our measurements to acquire more accurate age estimation. There is the Aristarchus crater, 40 km in diameter, nearby the Vallis Schroteri, so we eliminated the area blanketed by ejecta from the crater by using the Clementine and Kaguya/MI data and carefully remove the secondary craters showing the herringbone, cluster, chains, and elongated characteristics. We examined areas of the floor of the Vallis Schroteri, and of southwestern outside of the Aristarchus Plateau which is suspected as the lava pond to produce the Vallis Schroteri by spectral data. If these areas are originated by same lava flow, no difference of the results of age estimation among the areas. As a result, we estimated the age of the floor part of the Vallis Schroteri, as 3.10 (+0.25, -0.57) Ga, and the age of the lava pond, as 3.11 (+0.23, -0.50) Ga. The results show us that the possibility of lava pond to originate the Vallis Schroteri increases. And, the formation age of the Vallis Schroteri lead us to know occurrence of huge volcanism at the end of the Imbrian which is fade-out period of active volcanism of the Moon.

キーワード:シュレーター谷,蛇行谷,溶岩流,形成年代

Keywords: Vallis Schroteri, Sinuous rille, Lava flow, Formation age