Final report of UHH-KU fund for ECR program

Section 1

Applicant (at the time of application, i.e. supervisor of the visiting researcher or the visiting researcher themselves)	
Name	Taishi Yamada
Job title	Associate Professor
University	Kyoto University
Affiliation	Disaster Prevention Research Institute

Section 2

Visiting researcher (if different from the above)	
Name	
Job title	
University	
Affiliation	

Section 3

Host researcher	
Name	Matthias Hort
Job title	Professor
University	University of Hamburg
Affiliation	Institute of Geophysics

Section 4

Summary of the project (approx. 200 words)
*KU visiting researchers are required to submit a summary of the project in Japanese in addition to the English summary (approx. 400 characters).

Advancing ongoing collaboration research
TY (KU visiting researcher) presented his research about volcanic ash emission amount estimates by infrasound observation at five volcanoes including Sakurajima in the UHH volcanology group seminar. Professor Hort(UHH host researcher) and his research group have operated doppler radars for volcanic ash emissions at Sakurajima volcano in collaboration with KU since 2018. TY and Professor Hort had discussions about research strategies for improving ash amount estimates based on radar (UHH) and ground-based (KU) observations, sharing some basic and important aspects of geophysical observation and research on both sides. Through the discussion, the dataset of the 2019 events has great potential to perform emission ash amount estimates from multiparametric approaches. TY also provided X-band radar and visual video image data at Sakurajima by KU.

Perspective for future collaboration research
The recent improvement of radar instruments can enable the doppler radar to measure ground displacement and possibly even seismic waves with a sufficient data sampling rate. To challenge ground displacement measurement at the summit area of Sakurajima volcano in the next collaboration research, we conducted a measurement test for displacement detection with doppler radar in UHH. TY also visited the radar developer company (METEK) to see the frontline of radar development.

既往共同研究の推進

滞在者（山田）は、桜島をはじめとする複数火山を対象とした空気振動観測による火山灰放出量推定の研究についてセミナー発表を行なった。桜島火山ではハンブルク大学が京都大学との共同研究としてドップラーレーダーによる噴煙観測を 2018 年から実施している。レーダー観測と京都大学による地上観測に基づく放出火山灰量推定の高度化の研究戦略について議論した。また京都大学による桜島火山での気象レーダーと可視画像映像の一部をハンブルク大学に提供した。

今後の共同研究の発展を見据えた取り組み

ドップラーレーダーのサンプリング性能の向上により、火山噴火に伴う噴煙だけでなく火山体の地表変位、地震動も計測できることが期待されている。将来的な桜島火山での観測を念頭に、ドップラーレーダーによる高サンプリングでの変位検出の測定テストをハンブルク大学構内で実施した。またレーダーの開発会社を訪問し、最前線の開発現場を見学した。