Gas composition and flux report

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Between 1st and 2nd April 2010 a team from the Italian Instituto Nazionale di Geofisica e Vulcanologia working in collaboration with the scientists from Institute of Earth Sciences, University of Iceland conducted remote sensing gas measurements on eruptive fissures at Fimmvörduháls. Three measurement techniques were applied: open-path FTIR, DOAS and an SO_2 imaging system. The FTIR spectrometer uses infrared radiation emitted from the erupting lavas as a radiation source for absorption spectrometry of volcanic gases emitted from the explosive vents. Spectra are analysed using a single-beam retrieval which allows path amounts of H_2O, CO_2, SO_2, HCl and HF to be determined. Favourable wind conditions allowed traverse measurements under the gas plume emitted from the eruption to be conducted with a DOAS spectrometer, allowing the flux of SO_2 to be determined. The SO_2 imaging camera was used to measure the individual gas emissions from the erupting fissures. Combining these measurements together we can report the following preliminary observations for 1st and 2nd April:

- The SO_2 gas flux produced by the eruption was ~3000 tonnes per day.
- Approximately 70% of the SO_2 flux was produced by the fissure which opened on 31st March, with ~30% emitted from the 21st March fissure.
- The flux of HF from the eruption was ~30 tonnes per day.
- Gas compositions emitted from the two eruption fissures were broadly similar, being very rich in H_2O (>80% by mole), <15 % CO_2 and <3% SO_2.
- Strong variations between 5 and 25 in the SO_2/HCl ratio were observed at the 31st March fissure on the two measurement days, with higher values observed on 1st April when the activity was apparently more intense than 2nd April.