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B43A-0219 **Real-time measurements of Hg^0 and H_2S at La Solfatara Crater (Campi Flegrei, Southern Italy) and Mt. Amiata volcano (Siena, Central Italy): a new geochemical approach to estimate the distribution of air contaminants**

Session: Atmosphere-Surface Exchangeable Pollutants: Emissions, Environmental Processing, Governance, and Perturbations Related to Global Change I Posters

The emission of Hg and H_2S from natural and anthropogenic sources may have a great environmental impact in urban areas as well as in the surroundings of active and passive degassing volcanoes. Mercury is present in the atmosphere mainly in its elemental form (Hg^0~98 %), which has a relatively high volatility, low solubility and chemical inertness. Hydrogen sulfide, one of the most abundant gas species in volcanic fluids, is highly poisoning and corrosive.
In this study, an innovative real-time method for the measurements of Hg^0 and H_2S concentrations in air was carried out at La Solfatara Crater, a hydrothermally altered tuff-cone nested in the town of Pozzuoli (Southern Italy), and at Mt. Amiata volcano (Central Italy), where a world-class Hg mining district abandoned in the seventies and a presently-exploited geothermal field for the production of electrical energy occur. The main aims were (i) to test this new methodological approach and (ii) to investigate $Hg^0$and H_2S concentrations and the chemical-physical parameters regulating their spatial distribution in polluted areas.
A portable Zeeman atomic absorption spectrometer with high frequency modulation of light polarization (Lumex RA-915M) was used in combination with a pulsed fluorescence gas analyzer (Thermo Scientific Model 450i) to measure Hg^0 and H_2S, respectively. The instruments were synchronized and set at high-frequency acquisition (10 sec and 1 min, respectively). Measurements were carried out along pathways (up to 12 km long) at an average speed of <10 km/h and coupled with GPS data and meteorological parameters. In selected sites, passive samplers were positioned to determine the time-integrated Hg^0 and H_2S concentrations to be compared with the real-time measurements.
The results indicate that this approach is highly efficient and effective in providing reliable and reproducible Hg^0 and H_2S concentrations and can be used to identify and characterize gas emitters in different environments.

Authors

- Jacopo Cabassi - University of Florence
- Sergio Calabrese - University of Palermo
- Franco Tassi - University of Florence
- Stefania Venturi - University of Florence
- Francesco Capecchiacci - University of Florence
- Claudia Di Lonardo - University of Florence
- Walter D'Alessandro - Ist Naz Geofis & Vulcanologia
- Orlando Vaselli - University of Florence