Since 1979 it has been possible to determine the column amount of volcanically generated SO$_2$ from space. The NASA/TOMS instrument measures scattered UV sunlight and was originally designed to retrieve ozone columns, but has been successfully used to observe medium to large scale SO$_2$ emitted by volcanoes. The HIRS instruments on board operational polar orbiting meteorological satellites are also able to observe large volcanically generated SO$_2$ clouds by using measurements in the infrared region around 7.3 $\mu$m. More recently, the advanced space-based instruments, OMI, GOME/GOME-2, IASI and AIRS, have been used to provide more accurate and reliable SO$_2$ column retrievals. These instruments use UV and IR measurements and may be regarded as independent. A 4-way (OMI, GOME-2, IASI and AIRS) intercomparison of SO$_2$ column retrievals for several recent volcanic eruptions is presented. The attributes and deficiencies of each of the retrieval schemes is compared and contrasted in an effort to determine the accuracy, precision and biases of the four different sensors. These intercomparisons are being used to develop a single, synergistic satellite-based SO$_2$ product that may be used by climate scientists to study the effects of volcanic SO$_2$ on the Earth’s climate system. In addition it is planned that these data can be used to retrospectively improve SO$_2$ retrievals from the older TOMS and HIRS global SO$_2$ measurements. The final result is expected to be a 30 year record of global volcanic SO$_2$ emissions determined from space for both the stratosphere and mid-to-upper troposphere. The SO$_2$ record could be used to assess the impact of SO$_2$ on climate through climate model simulations, leading to improved estimates of the effects of volcanoes on climate, and to study chemistry-climate interactions through a combination of space-based observations and chemistry modelling.