# Kuehn Et Al

The INternational focus group on Tephrochronology And Volcanism (INTAV) conducted an intercomparison study of electron-beam microanalysis of volcanic glasses across global tephrochronology laboratories. The intercomparison looked at the methods, precision, and accuracy of analyses within the global tephrochronology community, and made several suggestions for improvement. Twenty-four institutions in nine countries submitted data from 27 instruments. Each laboratory received three samples for comparative analysis: rhyolitic obsidian from Lipari Island in Italy, phonolitic Sheep Track tephra from Mt. Edziza in British Columbia, and basaltic tephra from the Laki volcanic eruption in Iceland. A fourth sample of Old Crow tephra from Alaska was distributed as well, but was not included in the intercomparison. The four samples together form a now widely-distributed set of standards, with which tephrochronologists can compare calibrations and analyses, and so strengthen the validity of tephra correlation and fingerprinting. Despite widely varying methodologies and calibration standards, analyses between labs were generally in agreement with each other and with "control" analyses obtained via alternate methods such as XRF. The exceptions to this were elements present in low concentrations, and $Na_2O$. Most laboratories tried to either limit alkali element migration by using a defocused or rastered beam and/or a lower beam current, or by directly measuring and correcting for the migration. In spite of this, only half of the analyses for $Na_2O$ fell within one standard deviation of the mean obtained via alternate methods, with the majority yielding a lower value. In summary, mechanical suggestions to improve accuracy for $Na_2O$ and the low-concentration elements included using lower beam currents and defocused beams, and reducing the acceleration voltage. Suggestions for procedural improvements included analyzing readily-migrating elements Na, Al, and Si first, or all at once if possible; selecting appropriate calibration standards; and maximizing use of the spectrometer with background count adjustments. Finally, suggestions for improved analytic methods included screening for outliers prior to mean calculations.