Evaluation of Measurement Uncertainty

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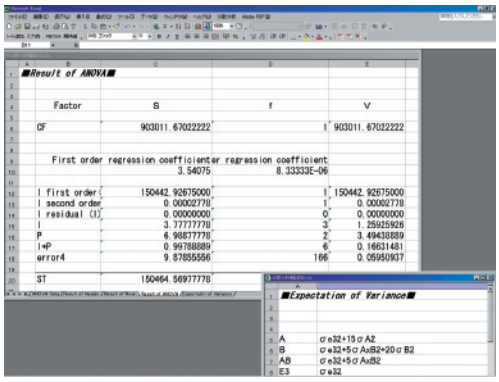
We have developed new computer programs for evaluation of uncertainty in measurement. One of the programs is to perform the analysis of variances (ANOVA) in which the expression for expectation of each variance can be symbolically generated. This software is expected to greatly reduce labor required in uncertainty evaluations.

The other program is to evaluate the uncertainty of gear tooth profile measurement using Monte Carlo simulation. We formulated a geometrical model for a gear measurement machine, and constructed a "virtual-machine" in a computer. The uncertainty of gear tooth profile measurement is calculated from the geometrical errors of the virtual-machine. This program can be applied to most of the gear measurement machines.



Example of ANOVA program output

Geological Survey and Geoscience

Geological Study of Fuji Volcano, Japan
- for evaluation of evolving volcano -

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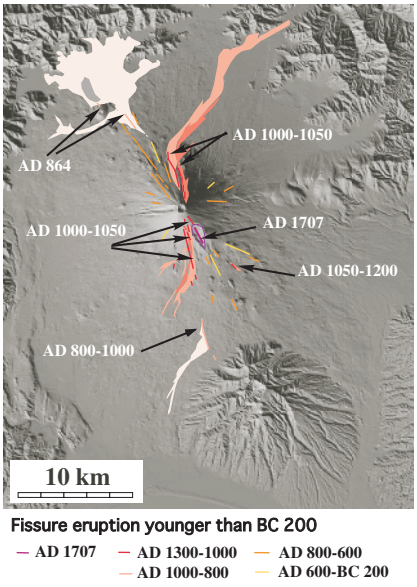
The mapping of Fuji volcano including trench surveys of more than 30 sites are carried out in Geoscience Institute, AIST. Evolution of Fuji volcano is investigated quantitatively with dating. For example, many historical fissure eruptions are discovered (Fig.). Moreover, time series diagrams of cumulative eruptive volume and fissure eruption sites younger than BC200 shows various time-dependant patters in response to changes of boundary conditions such as magma supply rate and stress field.



Distribution of fissure eruptions younger than BC200