# Data Analysis Working Group (DA-WG) 2014-2015 report

Pasha Ponomarenko

*University of Saskatchewan, Canada*

# Excerpt from 2014 DA-WG meeting

Under the current operation regime (integration time length), the major contribution to the measurement errors is coming from the statistical variability of the signal itself. Therefore, one would not expect to see much difference between different fitting techniques provided they are implemented correctly. The current implementation of the least square fitting in FITACF is far from optimal, so we need to bring it up to the conventional standards. Only after this we can start using it as a reference for other fitting techniques, so at this stage we need to focus mainly on "cleaning" the FITACF.

Required modifications:

1. Weighting – different sets of weighting coefficients for power and phase.
2. Accounting for cross-range interference through proportional weighting of the fitting coefficients rather than simply dropping the data when a certain threshold is exceeded.
3. Correct estimation of the fitting errors based on the number of independent measurements (i.e. number of pulses in the sequence rather than the number of ACF lags).

Implementation:

Last autumn, AJ agreed to implement these changes but then moved to Silicon Valley. We need to get in touch with him to find out if he is still keen/has time to go ahead with this. Mike Ruohoniemi will get in touch with AJ to find this out.

# Progress

- Mike arranged Pasha's and AJ's meeting at VT in late August 2014. AJ started refactoring FITACF on a separate *github* branch but he had insufficient time to finish it (less than a day).
- In order to fill the gap, UoS group managed to secure CFI funds to employ a local Engineering graduate Keith Kotyk as Software Engineer. Keith started in mid May and is currently getting familiar with RST and FITACF. His immediate tasks are
  - to finish refactoring
  - to implement the required changes.

# Routine tasks performed

- Task #5: Kevin Sterne proposed sanity checks for two sources of software crashes:
  - zero values of *smsep* and *txpl* (badlags)

  and
  - number of range gates exceeding 100 (make_fit and make_fitex).