# Lvmini for C++ world

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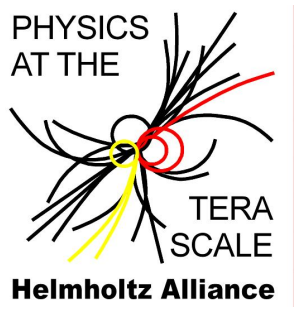



Statistics Tools Group Meeting
DESY, Hamburg, November 18, 2009

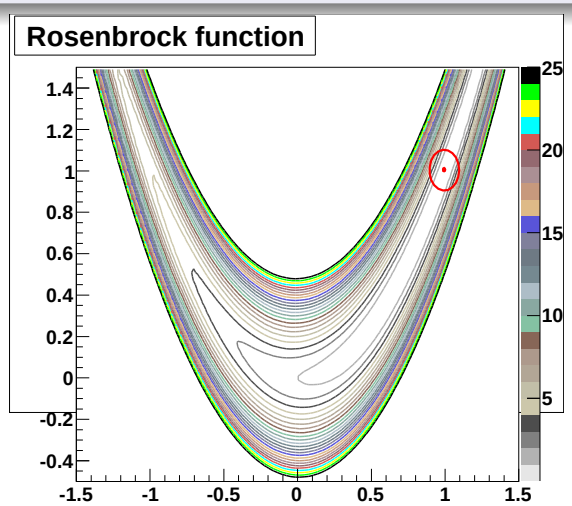
# LVMINI: Reminder

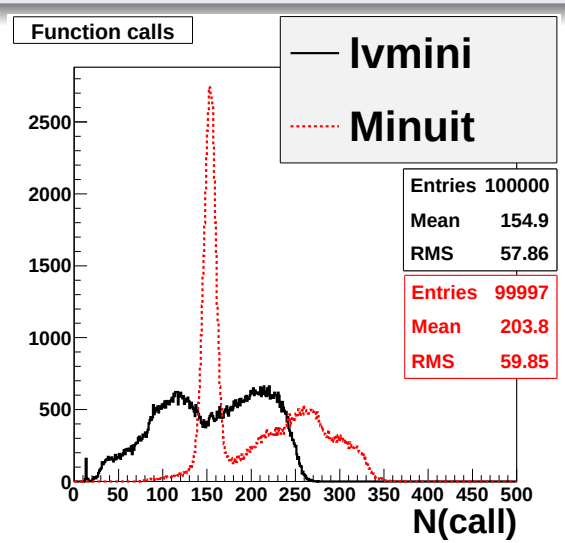
## Efficient Minimisation Program (V. Blobel)

- L-BFGS algorithm:
  matrix-less quasi-Newton method.
- Few or many (aiming at up to $10^5$) parameters.
- Uncertainties: Rough estimate 'for free',
  detailed calculation if desired
  (but needs more function calls).
- User has to provide function value and gradient.
- Fortran program: www.desy.de/~blobel/largesc
- Application presented in last software review
  Nov. 2008:
  Calorimeter calibration (Uni Hamburg).

# LVMINI: Interfacing with C++/ROOT

- Prototype interface with ROOT:
  - Class inheriting from `ROOT::Math::Minimizer`.
  - Call Fortran from C++ using `cfortran.h` (from ROOT!).
  - Not thread safe...
- Preliminary benchmarking with Rosenbrock function:
  - less function calls,
  - Minuit sometimes not converging.
  - Lvmini sometimes not as close to the minimum as Minuit.



## Outlook

- Goal:
  Integration as alternative fitting mechanism in ROOT.
- Standalone non-ROOT C++ interface.
- Does ROOT accept fortran code?
  Rewrite in C++ otherwise?
- More benchmarking:
  - Straight line fits (as in manual).
  - Need scenario with many parameters:
    Ideas?