ESR18: Hosted by U Warsaw

ESR18
- 18 months on Higgs Tools budget, starting in 2014 (exact date TBD), remaining 18 months to be financed form Polish resources;
- supervisor: Jan Kalinowski (TBC);
- co-supervisors: Elżbieta Richter-Wąs or Michal Bluj (depending on applicant's interests).

Workpackage 2
Task 2.2: Improved predictions for non-standard electroweak symmetry breaking scenarios
a) theoretical analyses of models of electroweak symmetry breaking,
b) their implementation into a Monte Carlo code,
c) assessment of tau leptons as taggers of WL

Target:
- Precision calculations for vector boson scattering in non-standard Higgs boson scenarios and their confrontation with experimental data
- simulation of signal and background processes is necessary in a flexible way.

Connections with ATLAS and CMS collaborators (in particular Torino, CERN, Annecy, also Athens and NIKHEF) outside network Bonn, Aachen, Dresden.

ESR18: Why U Warsaw

Extensive programme over a long period of time:
- extensive program of model building and phenomenological analyses of the beyond Standard Model scenarios,
- phenomenology of 2HDM and supersymmetric models
- expertise in construction of computer codes for e.g. Higgs decays, lepton flavor violating processes, spin analysers via τ lepton production and decay,
- implications for and constraints from dark matter searches
- more recently investigations of the role of newly discovered Higgs boson(s) in unitarising the vector boson scattering processes and of alternative scenarios of electroweak symmetry breaking

Permanent staff currently involved:
- J. Kalinowski, M. Krawczyk, S. Pokorski, J. Rosiek, M. Bluj, A. Kalinowski, M. Szleper, K. Rolbiecki
- 2 PhD and 2 MSc students involved

ESR18: What?

ESR18 would work directly on
- precision calculations for WW scattering processes in alternative scenarios of electroweak symmetry breaking
- their implementation in and development of numerical tools
- search for analysis strategies to enhance experimental sensitivity to possible deviations from the Standard Model expectations
- modelling of tau leptons as taggers of WL (W longitudinal) .

Role as "trainee" for LHC activities
- theoretical calculation and development of numerical tools for modelling the WW scattering processes
- implementation of numerical tools into software environment of LHC.

Role as "trainer" for LHC activities
- feasibility of applying proposed new tools within ATLAS or CMS;
- understanding and interpretation of experimental measurements and limits.