# Evidence of relations between EM groups

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- Physics Focus(es)

- People

- Commonalities

  - common activities

- Differences

  - Resources

- Summary

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# Physics Focus

## EM (Std)

- Created for HEP detectors:
  - Performant for calorimeters
  - Specialised models for trackers
    - Transition radiation, Photo Absorption Ion.
- Energy range:
  - 1 KeV to 100s GeV

## Low-energy EM

- Applications in space science, medicine, specific HEP environments (underground, EM background for e+/e-, ..)
- Extension of energy range down to
  - 250 eV for electrons, g —
  - for hadrons and ions down to the value of the ionisation potential
- Requirements include the ability to simulate
  - Atomic relaxation
  - polarisation

# People

## EM (Std) Working Group

- Michel Maire (coordinator, LAPP)
- Helmut Burkhardt (CERN)
- Vladimir Grichine (CERN, Lebedev Physical Institute, Moscow)
- Peter Gumplinger (TRIUMF)
- Vladimir Ivantchenko (Budker Institute for Nuclear Physics, Novosibirsk, CERN, HARP)
- Stanislav Kelner (MEPhI,Moscow)
- Rostislav Kokoulin (MEPhI, Moscow.)
- Glenn Patrick (PPARC)
- A. Rybin (IHEP Protvino)
- Laszlo Urban (KFKI Budapest)

## Low Energy EM: (physics models & tests)

- Maria-Grazia Pia (INFN Genova) and Petteri Nieminen (ESA ESTEC) (co-coordinators)
- H. Araujo
- S. Chauvie  student
- G. Depaola
- J.M. Fernandez-Varea (Univ. Barcelona)
- F. Foppiano
- S. Guatelli (CERN, Univ Genoa) student
- A. Howard (Imperial College, London)
- V. Ivanchenko
- F. Longo
- A. Mantero  student
- R. Svensson (Karolinska Institutet)

plus others on additional activities (advanced examples, testing infrastructure, ..)

# Commonalities

- Standard processes were base for first low-E design and implementation
- One common member (V. Ivantchenko)
- Cross tests regularly performed
- Problems found in one domain are checked in the other
- Common sessions at G4 workshops and topical meetings at other times
- Common interfaces
  - Design iteration to achieve a greater flexibility of usage of different electromagnetic physics models (in progress)

# Differences

- Priorities differ:
  - EM (Std) is refining process models/ implementations, concentrating on performance
  - Low Energy is developing new models to address additional user requirements.
- Software processes differ.
- Resources are greatly from different interested parties!

# Summary

- Physics focus of two groups is targeted on different applications

- Regular discussions on common topics and interfaces.

- Resources drawn from different interested parties.