Emerging UR from Medical Physics domain

S. Guatelli

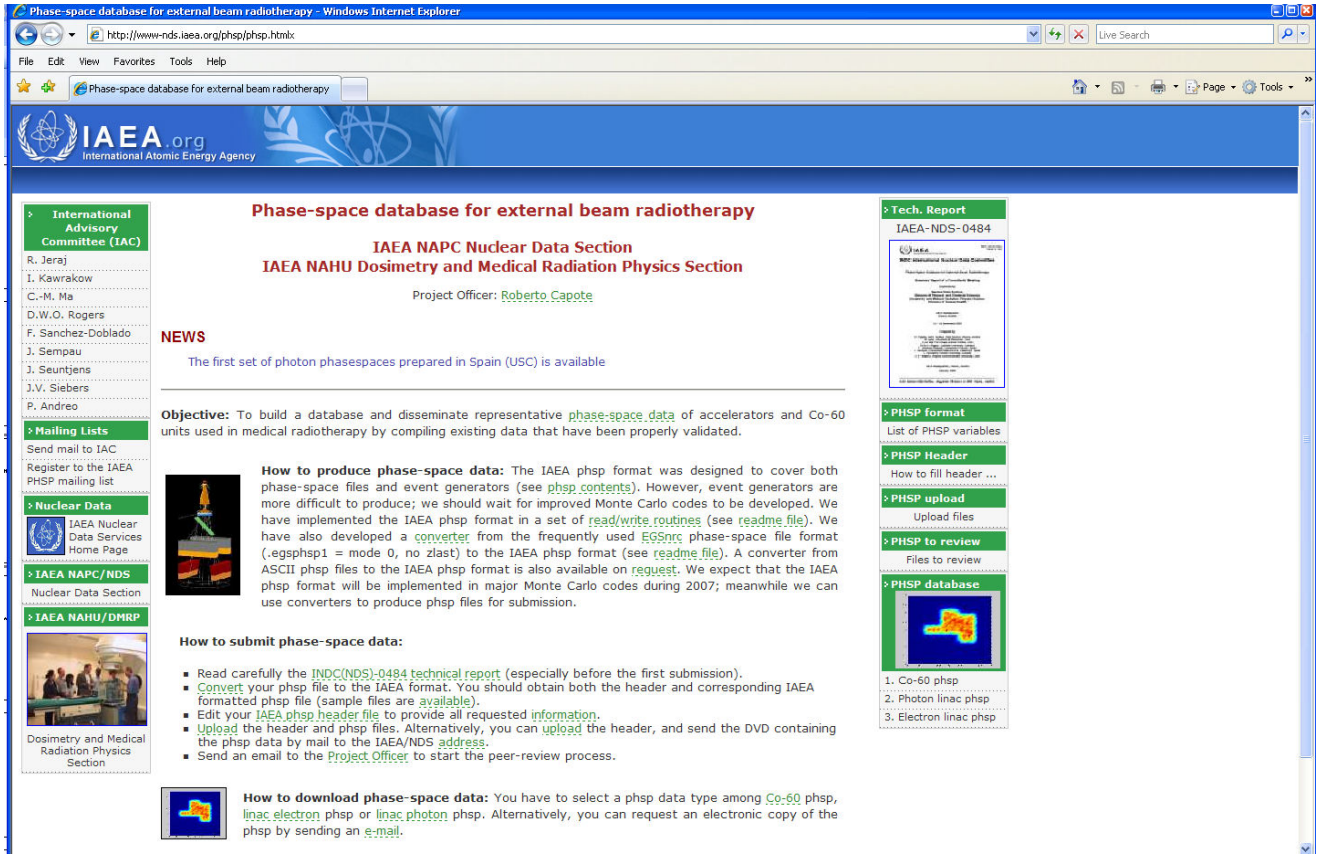
Geometry UR

- **UR1.1**: Re-incorporate the STEP interface
- **UR1.2**: Create a DICOM interface in the Geant4 kernel
- **UR1.3**: User friendly method to build complex beam line geometries (i.e. multileaf collimator for linac)
- **UR1.4**: Create a component *G4VoxelisedPhantom* in the Geant4 kernel

  Note: the phantom is a water box, voxelised by means of RO Geometry

Primary UR

- **UR2.1**: Create an interface to read IAEA phase-space data in the Primary Particle component



Physics UR (1)

- **UR3.1**: Model Very Low Energy extensions in **vapour water**
- **UR3.2**: Model Low Energy extensions in **silicon**
- **UR3.3**: Model biological effect of radiation (LEM model)
- **Note:** ESA contract **ESTEC/ITT AO/1-6041/09/NL/AT** for the period 2010-2013
- **UR 3.4**: Interface to external physics models
- **UR 3.5**: Update mean excitation energies

Physics UR (2)

- **UR 3.6:** Precise isotope creation in water/tissue
  - Protons, alpha
  - Neutron
  - C11, O15

- Improve and validate existing physics models

Analysis UR

- **UR4.1:** Histogram format compatible with Matlab, Origin, Octave

Quick response: crucial issue

- **UR 5.1:** Increase simulation speed

  (DIANE, GPU-CUDA, etc.)

  - Find a general solution?

Other UR

- **UR 6.1**: Store extra information (regions traversed by particles, regions where particles interacted, ...) for debugging

- **UR 6.2**: Reverse MonteCarlo

Other comments

Documentation should be improved

- The G4 Radioactive Decay module documentation should be improved
- More detailed documentation on DICOM interface
- More documentation on the use of variance reduction techniques
- More documentation of the physics lists to adopt, and their validation

Other: user network

- To develop a strong Geant4 European Medical User (G4EMU) Community
  - Like G4NAMU