



Advanced geometry hands on

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Practice with translations and rotations in Fluka

- `$start_translat`
- `$start_transform`
- ROT-DEFI
- ROTPRBIN
- Good practice in element modeling

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Geometry construction

- Start from the given input file
- Notice that all the geometry elements are there:
 - 1 exp. hall, 1 exp. chamber, 1 collimator, 1 image plate detector
(if you don't see them, look in the origin and on different views)
- Move the experimental chamber within the experimental hall
- Move the collimator and the image plate within the exp. Chamber
(details on the next slide)
- Notice the use of Bounding Boxes in the definition of the elements

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Geometry construction and scoring

- Translate Exp. Chamber bodies by $\Delta x=2500$ cm, $\Delta y=80$ cm, $\Delta z=2400$ cm
- Translate Image plate bodies by $\Delta x=2550$ cm, $\Delta y=110$ cm, $\Delta z=2470$ cm
- Transform Collimator bodies using 2 ROT-DEFI cards:
 - 1-Rotation around Y-axis by 2° (inside an “ **#if / #endif** ”)
 - 2-Translation by $\Delta x=2550$ cm, $\Delta y=110$ cm, $\Delta z=2450$ cm
- Score the energy deposition on the collimator
 - The USRBIN card is there already
 - The ROTPRBIN card needs to be filled

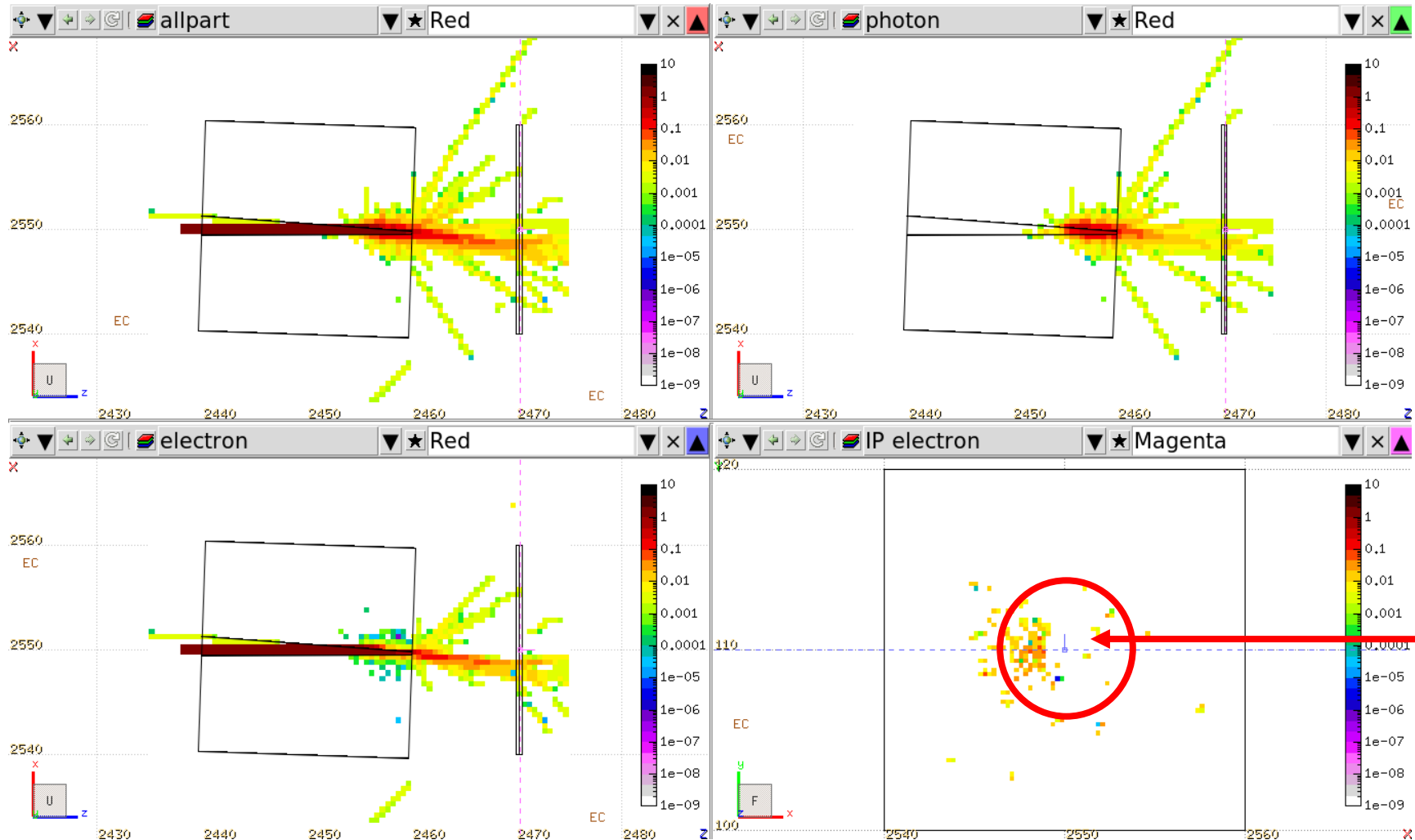
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Running the simulations and looking at the results

- For the case with the rotation, run 5000 primaries (use cycles and spawns)
- Merge the results
- Adapt the already available layers in the Geometry editor
- Look at the particle fluences for the two cases
 - x-z plane over the whole geometry
 - z-y plane over the image plate
- Look at the scoring of the energy deposition on the collimator
- In the geometry editor, try to add a layer to visualize the rotated USRBIN mesh from the input file (i.e. just the mesh definition, not result simulation results)

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Particle fluence with tilted collimator



The electron beam does not hit the center of the Image Plate

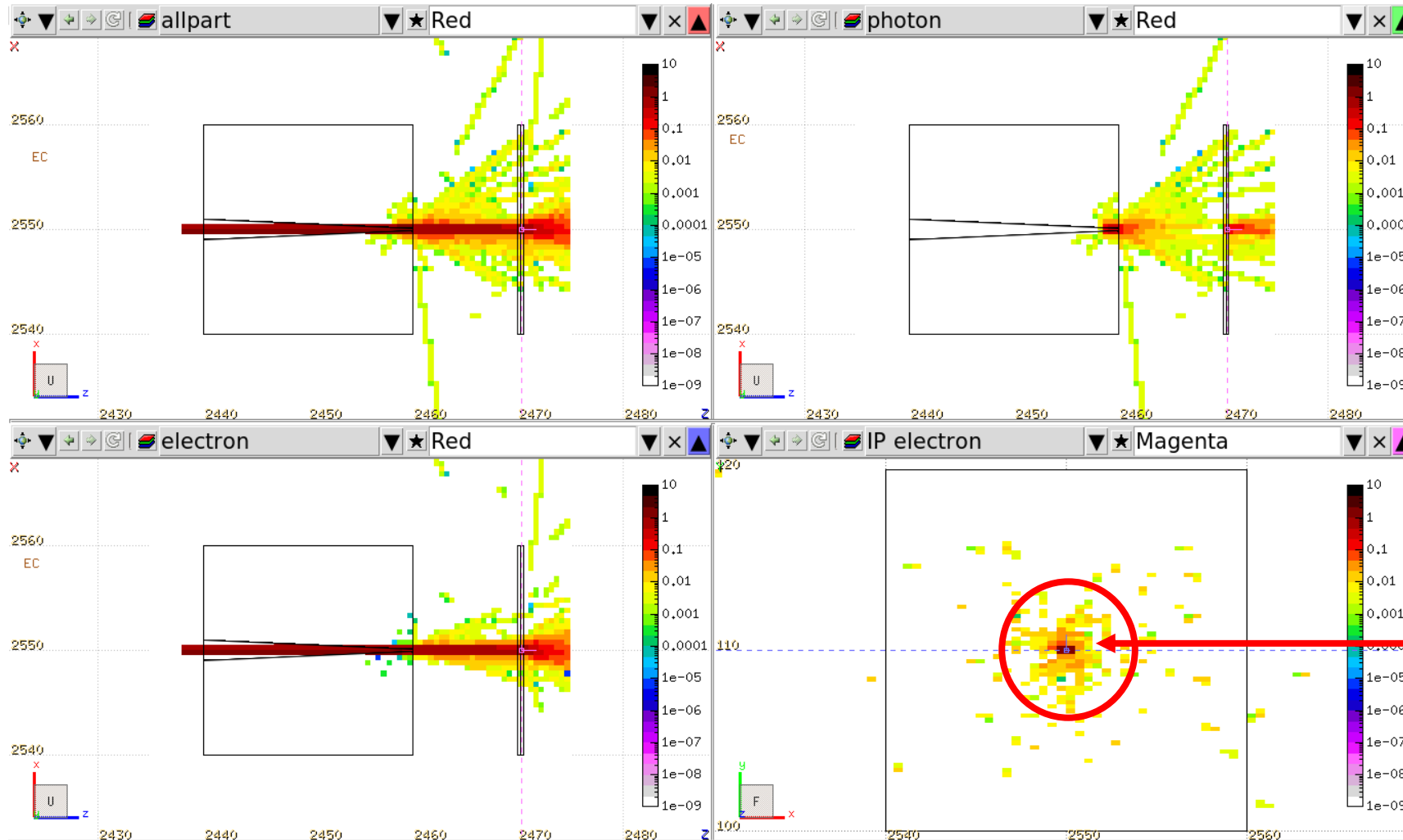
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Particle fluence with straight collimator

- Disable the collimator rotation using the preprocessor instruction
- Run with the collimator aligned
- Compare the results (impinging point on the Image Plate)

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Particle fluence with straight collimator

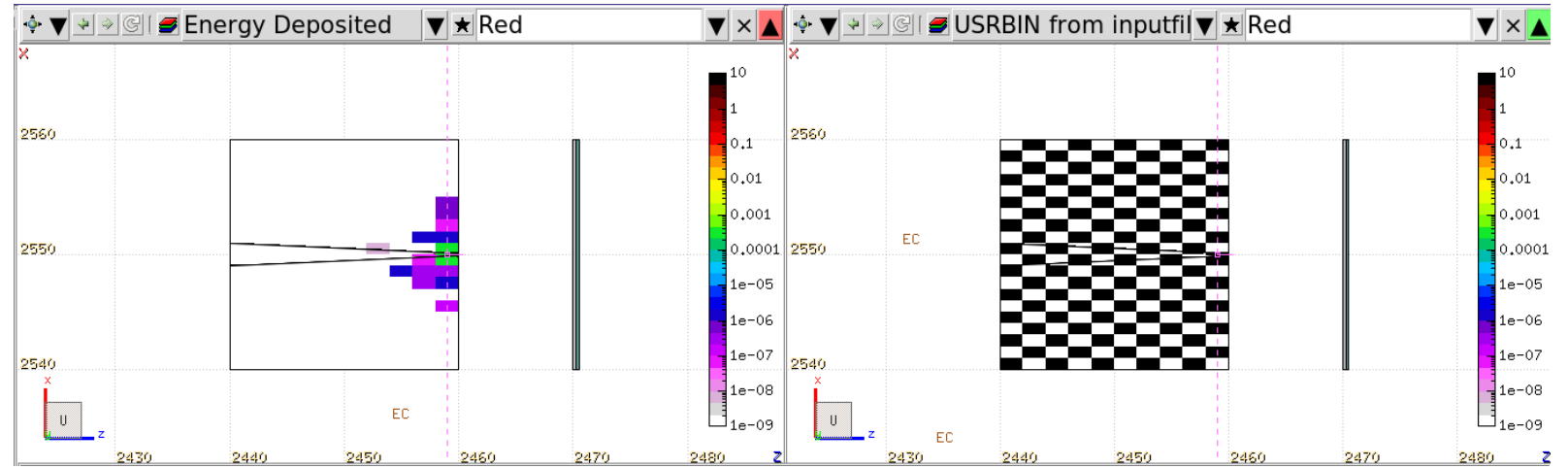


The electron beam hits the center of the Image Plate

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Energy deposition

Without collimator rotation



With collimator rotation

