Our EOS and opacity functions support our UQ efforts.

- For the uncertainty quantification: we use the model, based on:
  - first principles;
  - specified assumptions (LTE);
  - controllable list of the input parameters;
  - ionization potentials;
  - excitation energies, multiplicities;
  - cross-sections;
  - oscillator strengths etc.
- Consistency: calculate opacity and EOS under the same assumptions.
- We benefit from a capability to verify our models with the “gold standard” models (such as SESAME). However, the use of black-box models sometimes appears problematic:
  - Similarly to good overall agreement of the “black-box” model with the “transparent” model.
  - The partition functions in SESAME differ from those we use for EOS in CRASH, raising the issues of:
    - consistency of EOS and opacity models;
    - utility of uncertainty quantification.

Equation-Of-State and Opacity Status. Should we Have the Laser Package too?
Igor V. Sokolov and CRASH team.

CRASH target geometry

CRASH vs CESAME: multi-group opacities.

On the Laser package. We already have the ray tracing. Why?

Igor V. Sokolov and CRASH team.

EOS and opacity calculation: general scheme

Ionization degree: in xenon (the role of the Coulomb interaction) and in polyimide (vs CESAME)

Can we trace the electromagnetic wave beam in a plasma? Yes, we can.

The drama about the plastic.

Each pixel in the synthetic radio-image is the origin point for a ray to be traced.

- The rays refract and reflect while approaching the critical density.
- Emissivity should be integrated over the ray, to obtain the intensity in the given pixel.
- Quite analogous problems should be solved by the laser package, to find the laser beam attenuation and the energy deposition.
- Presumably, for the blue-light the plasma resonance effects are negligible.