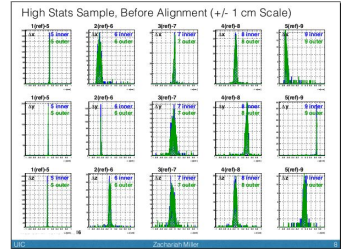
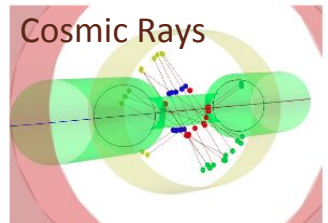
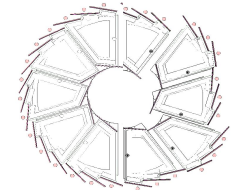
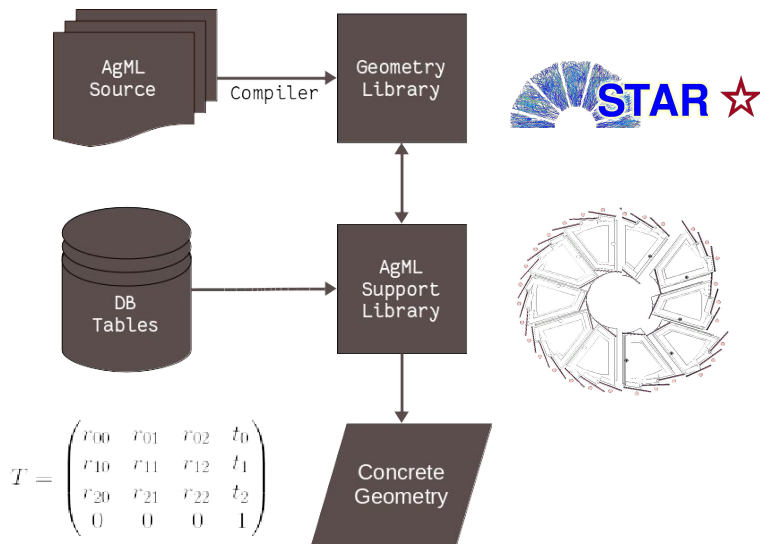


# Representing Misalignments of the STAR Geometry Model using AgML

- ★ The Heavy Flavor Tracker extends STAR’s physics reach into the heavy flavor sector, requiring precise simulations accounting for the many misalignments of sensitive volumes in the geometry.
- ★ Hit moving strategies, successful at the mm-scale of hit resolution, do not work as we move to μm-scale precision detectors.
- ★ The STAR geometry model is described by an Abstract Geometry Modeling Language: AgML [1]
- ★ We have extended the AgML syntax and software libraries to provide support for misalignments, beyond hit moving already implemented in STAR
  - Syntax to represent the misalignment of physical volumes
  - Interface associating misalignment parameters stored in the STAR database to physical volumes
  - Support for misaligning groups of physical volumes with the same misalignment parameters
- ★ HFT experimental alignment procedure used to extract misalignments applied to pixel detector in simulated cosmic rays, demonstrating a path forward for precision simulations with the full HFT.



[1] The abstract geometry modeling language (AgML): experience and road map toward eRHIC Jason Webb et al 2014 Journal of Physics: Conference Series 513 022036