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The Abstract geometry Modeling Language (AgML): Experience and Road map toward eRHIC

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The STAR experiment has adopted an Abstract Geometry Modeling Language (AgML) as the primary description of our geometry model. AgML establishes a level of abstraction, decoupling the definition of the detector from the software libraries used to create the concrete geometry model. Thus, AgML allows us to support both our legacy GEANT3 simulation application and our ROOT/TGeo based reconstruction software from a single source, which is demonstrably self-consistent. While AgML was developed primarily as a tool to migrate away from our legacy FORtran-era geometry codes, it also provides a rich syntax geared towards the rapid development of detector models. AgML has been successfully employed by users to quickly develop and integrate the descriptions of several new detectors in the RHIC/STAR experiment including the Forward GEM Tracker (FGT) and Heavy Flavor Tracker (HFT) upgrades installed in STAR for the 2012 and 2013 runs. AgML has furthermore been heavily utilized to study future upgrades to the STAR detector as it prepares for the eRHIC era.

With its track record of practical use in a live experiment in mind, we present the status, lessons learned and future of the AgML language as well as our experience in bringing the code into our production and development environments. We will discuss the path toward eRHIC and pushing the current model to accommodate for detector miss-alignment and high precision physics.

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