Update on the Gyro-Kinetic DataBase project

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The Gyro-Kinetic DataBase (GKDB) is a publicly accessible database of δf flux-tube gyro-kinetic simulations of tokamak plasmas. It was designed to be a repository for simulation data, a platform for code benchmarks and a stepping stone for the development of fast and accurate turbulent transport models based on the quasi-linear approximation. The project is hosted and documented on GitLab at `https://gitlab.com/gkdb/gkdb`

The physical inputs and outputs of the gyro-kinetic simulations stored in the database are normalised and defined using unified conventions. These conventions constitute the IMAS "gyrokinetics" standard. All the gyrokinetic codes coupled to the database can therefore be easily benchmarked against each other. The code specific parameters (grids, code version, etc.) are also stored in the database to ensure the reproducibility of the simulations. Linear and non-linear simulations can be stored. This offers the possibility to build fast quasi-linear models by training neural network on the linear simulation data and test their robustness against the non-linear simulation data.

The structure of the database, the procedure to import and export data, the automated checks implemented and the wrapper scripts available (GKW, GENE, QuaLiKiz, ...) will be presented. Examples of database usage including automated code benchmarks and data visualisation will be given.