Abstract Submitted
for the MAS17 Meeting of
The American Physical Society

IDL Implementation of the Fast Gyrosynchotron Codes ALICE GAO, Princeton University, ZACHARY BREIT, Union County Magnet High School, JASON WONG, John Hopkins University, ALEXEY KUZNETSOV, Institute of Solar-Terrestrial Physics, Irkutsk, GELU NITA, GREGORY FLEISHMAN, New Jersey Institute of Technology — Fast Gyrosynchotron Codes in GX_Simulator were originally written in Fortran and C++ and could only be executed using operating system-dependent executables. In the first step for future compatibility across operating-systems, Fast Codes was rewritten in IDL. It was done without referencing the original code in Fortran and C++ to allow for optimal calculations and program speed inside IDL. All the functions were first written as they appeared on paper into the program; then they were then changed to the proper 1D array or 2D array and proper matrix multiplication was then implemented in the program. All of the data was stored in arrays because for loops had to be avoided since they slow down calculations in IDL. As a result, after Fast Codes was properly implemented, much of the optimizing involved fixing matrix operations so they would be more efficient. The output of Fast Codes plotted intensity values calculated from IDL against the original executables from Fortran. Different parameters were then tested to see the functionality of the IDL program underneath different circumstances. It was discovered that the program did not work too well with extremely low temperatures. Fast Gyrosynchotron Codes was then included in the official update of GX_Simulator later that year.

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Date submitted: 30 Sep 2017 Electronic form version 1.4