

GLobal airglOW (GLOW) Model Schematics

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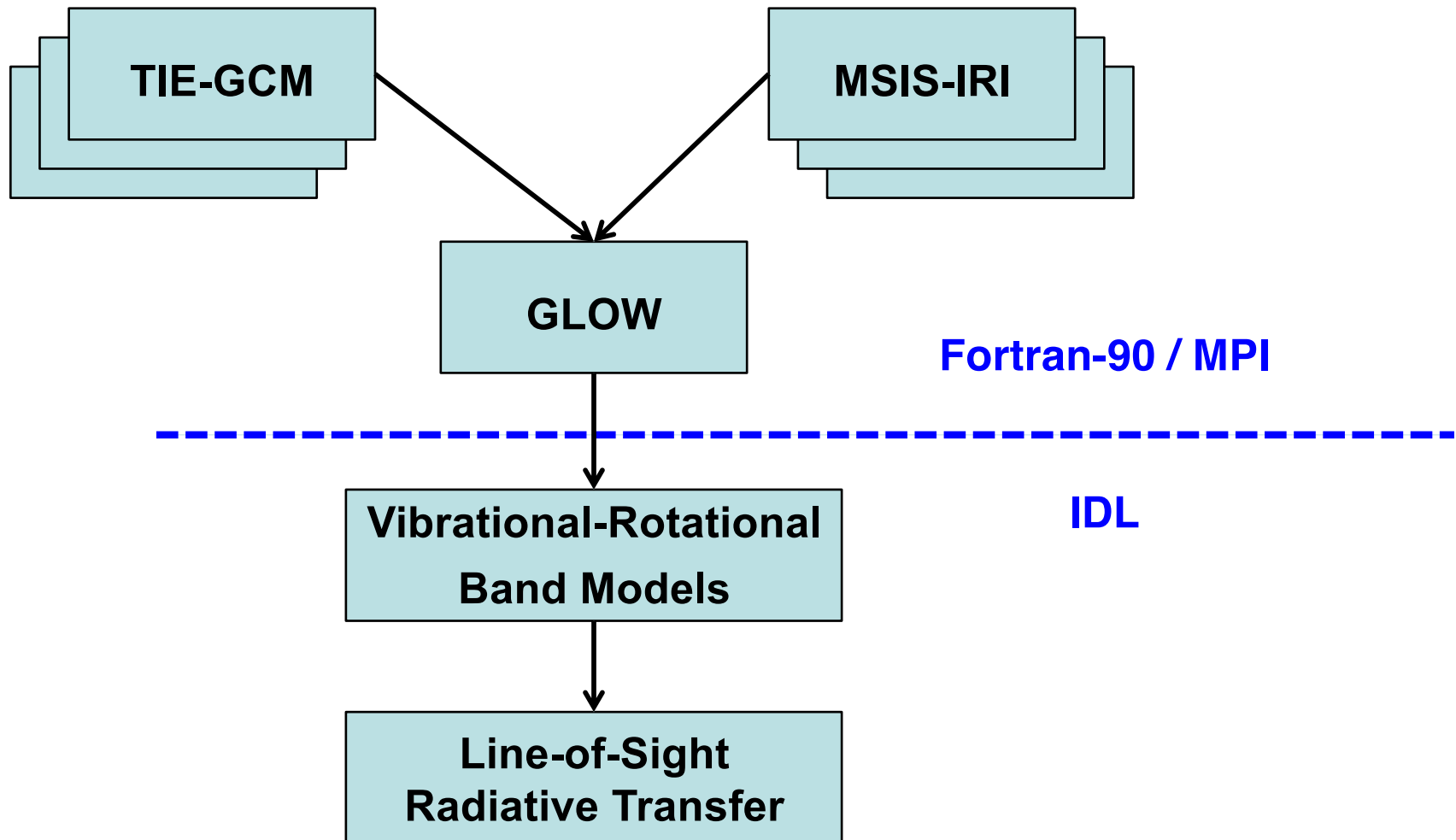
High Altitude Observatory
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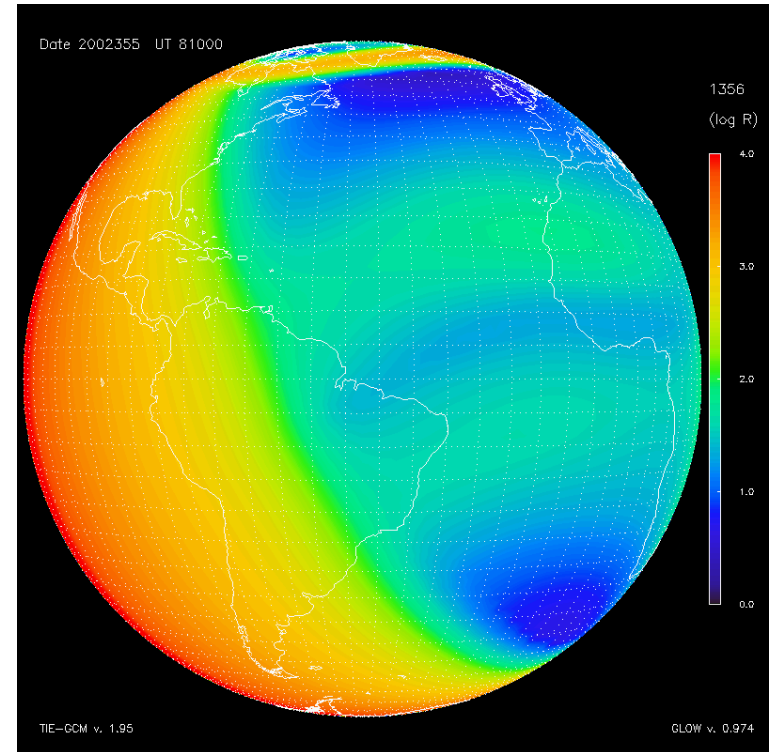
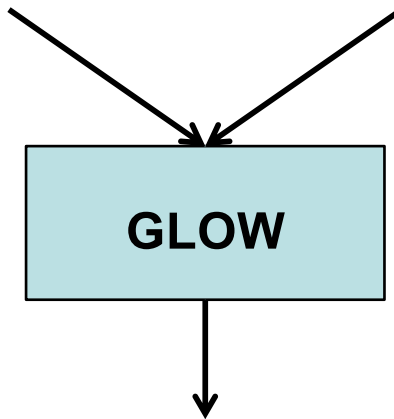
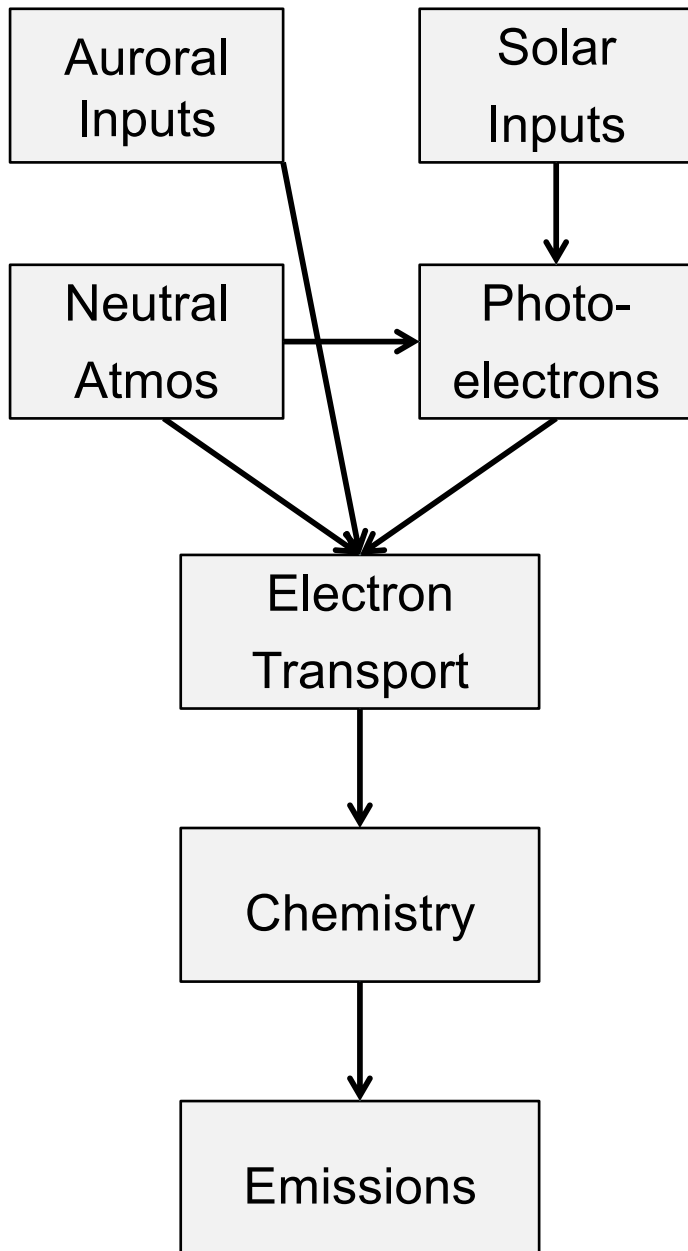


High-Level Overview Schematic



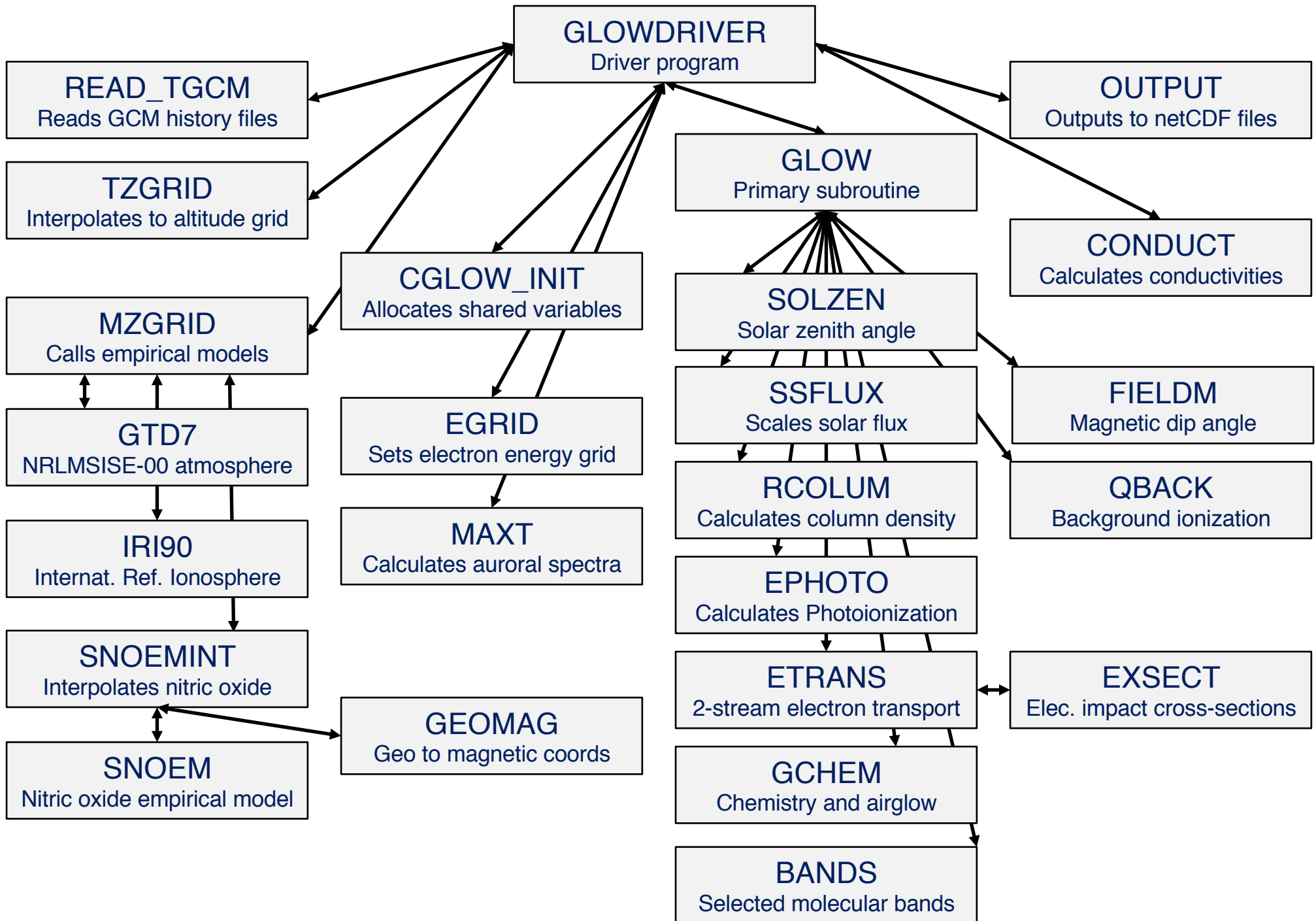
This schematic gives an overview of the GLOW model approach. General circulation model or empirical model inputs of thermosphere/ionosphere state variables are input to GLOW, which then calculates ionization rates, ionized and excited species densities, and airglow volume emission rates. Those rates can be used in vibrational-rotational models of various molecular band systems, and line-of-sight or, if necessary (for optically thick emissions) radiative transfer calculations, are then performed. The GCM, empirical model, and GLOW calculations are all done in Fortran-90, but the VR, LoS, and RT calculations are all done in IDL.

Conceptual Overview Schematic



The main inputs to GLOW are: neutral thermosphere major species density (O , O_2 , N_2), minor species NO and $N(^4S)$, the electron density, the neutral, ion, and electron temperatures, all on a 1D altitude grid, for specified time and geographic coordinates. Solar flux, and auroral electron flux, are specified or calculated from parameters. Outputs include electron density calculated below 200 km, ionized and excited species density, airglow volume emission rates, and vertical column brightnesses. Various parameters used to calculate these are also available on output.

GLOW schematic using MPI program GLOWDRIVER



GLOW schematic using example single-processor program GLOWBASIC

