GITM Data Cube Read Me Files

I. Overview:

This brief report is intended as a guide for the user for the contents of the GITM Data Cube Files for Version 1.0. This will be updated as the DataCubes are Updated going forward.

Filenames: GITM_BaseLineDataCube.save
GITM_ExtendedDataCube.save

Types: Both are IDL.save files. You need only use the command: restore, "file.save" to import that data cubes into IDL.

Short Description: BaseLineDataCube.save contains fewer variables, focusing only on those that are inherent to GITM (things like temperature, density, etc). ExtendedDataCube contains derived data products, such as horizontal and vertical PressureGradients, Ion-Neutral coupling terms, viscosity effects, etc.

II. BaseLineDataCube.save

Contents: This datacube contains key variables from the GITM Simulation, below is an itemized list (also included in the documentation/comments in the *.pro files included with this release). These are 4-D Data Cubes, so they consist of variables that are (nTimes, nLons,nLats, nAlts).

i. nTimes: The total number of timestamps in the data cube (one timestamp/output for every 5 minutes in the event).
ii. nLons: Total number of Longitude points (Geographic Longitude)
iii. nLats: Total number of Latitude Points (Geographic latitude)
iv. nAlts: Total number of Altitude Points (Geographic Altitude).

Variable Name	Size	Units	Description	Type
GITMDataCubeAlts	(nTimes,nLons,nLats,nAlts)	km	Geographic Altitude	Float
GITMDataCubeLons	(nTimes,nLons,nLats,nAlts)	Degrees	East Longitude (0-360.0)	Float
GITMDataCubeLats	(nTimes,nLons,nLats,nAlts)	Degrees	Geographic Latitude	Float
GITMDataCubeTemp	(nTimes,nLons,nLats,nAlts)	K	Neutral Temperature	Float

GITMDataCubeRho	(nTimes,nLons,nLats,nAlts)	kg/m^3	Neutral Mass Density	Float
GITMDataCubeN2	(nTimes,nLons,nLats,nAlts)	m^{-3}	Neutral Number Density N_2	Float
GITMDataCubeO2	(nTimes,nLons,nLats,nAlts)	m^{-3}	Neutral Number Density O_2	Float
GITMDataCubeO	(nTimes,nLons,nLats,nAlts)	m^{-3}	Neutral Number Density O	Float
GITMDataCubeHe	(nTimes,nLons,nLats,nAlts)	m^{-3}	Neutral Number Density He	Float
GITMDataCubeUn	(nTimes,nLons,nLats,nAlts)	m/s	Neutral Zonal (East/West) wind	Float
GITMDataCubeVn	(nTimes,nLons,nLats,nAlts)	m/s	Neutral Meridional (North/South) wind	Float
GITMDataCubeWn	(nTimes,nLons,nLats,nAlts)	m/s	Neutral Vertical (Radial) wind	Float
GITMDataCubeUi	(nTimes,nLons,nLats,nAlts)	m/s	Ion Zonal (East/West) wind	Float
GITMDataCubeVi	(nTimes,nLons,nLats,nAlts)	m/s	Ion Meridional (North/South) wind	Float
GITMDataCubeWi	(nTimes,nLons,nLats,nAlts)	m/s	Ion Vertical (Radial) wind	Float
GITMDataCubeUT	(nTImes)	Hours	Universal Time at Timestamp	string
GITMDataCubeDate	(nTimes)	(DD/MM/YY)	CalendarDate	string
GITMDataCubeLocalTimes	(nTImes,nLons)	Hours	Local Time at each Longitude	Float
GITMDataCubeMBar	(nTimes,nLons,nLats,nAlts)	Kg	Mean Neutral Mass	Float
GITMDataCubeMBarI	(nTimes,nLons,nLats,nAlts)	Kg	Mean Ion Mass	Float
GITMDataCubeNDenTotal	(nTimes,nLons,nLats,nAlts)	m^{-3}	Total Neutral Number Density	Float
GITMDataCubeIDenTotal	(nTimes,nLons,nLats,nAlts)	m^{-3}	Total Ion Number Density	Float
GITMDataCubeJulianDate	(nTimes)		Julian Date	Float
GITMDataCubeJulian2000	(nTimes)		Julian 2000 Date	Float
nAlts	(nAlts)		Number of Altitude grid points	Integer
nLats	(nLats)		Number of Latitude grid points	Integer
nLons	(nLons)		Number of Longitude grid points	integer
nGITMFiles*	(nTimes)		Number of Time stamps	integer

*Note: nGITMFiles is the variable in the datacube, but this will be updated to be nTimes in a future version of the Data Cube

(Extended Data Cube Information Next page)

III. ExtendedDataCube.save

Contents: Similar to the Baseline data cube but with key derived quantities. (nTimes, nLons,nLats, nAlts). Note that all of these **accelerations are on the Neutrals.**

Variable Name	Size	Units	Description	Type
GITMDataCubeIonDragUn	(nTimes,nLons,nLats,nAlts)	m/s^2	(East/West) Ion-Neutral Drag acceleration	Float
GITMDataCubeIonDragVn	(nTimes,nLons,nLats,nAlts)	m/s^2	(North/South) Ion-Neutral Drag accel.	Float
GITMDataCubeIonDragWn	(nTimes,nLons,nLats,nAlts)	m/s^2	Vertical Ion-Neutral Drag Accel.	Float
GITMDataCubeViscUn	(nTimes,nLons,nLats,nAlts)	m/s^2	(East/West) Viscosity acceleration	Float
GITMDataCubeViscVn	(nTimes,nLons,nLats,nAlts)	m/s^2	(North/South) Viscosity accel.	Float
GITMDataCubeViscWn	(nTimes,nLons,nLats,nAlts)	m/s^2	Vertical Viscosity Accel.	Float
GITMDataCubeDelPUn	(nTimes,nLons,nLats,nAlts)	m/s^2	Pressure Gradient Accel. (East/West)	Float
GITMDataCubeDelPVn	(nTimes,nLons,nLats,nAlts)	m/s^2	Pressure Gradient Accel. (North/South)	Float
GITMDataCubeDelPWn	(nTimes,nLons,nLats,nAlts)	m/s^2	Pressure Gradient Accel. Vertical	Float
GITMDataCubeCorUn	(nTimes,nLons,nLats,nAlts)	m/s^2	Coriolis Accel. (East/West)	Float
GITMDataCubeCorVn	(nTimes,nLons,nLats,nAlts)	m/s^2	Coriolis Accel. (North/South)	Float
GITMDataCubeCorWn	(nTimes,nLons,nLats,nAlts)	m/s^2	Coriolis Accel. Vertical	Float