**"InputFileFolder":** directory that the input csv files are located in (usually a subdirectory of main.py. If not, user must change code in firn\_density\_spin.py). Use "" if the input files are in the same directory as main.py.

**"InputFileNameTemp":** Name of the temperature input file. Needs to be a csv. The first row is time (decimal date, i.e. 2015.3487) and the second row is the corresponding temperature at that time. Time must be going forward, i.e. the first column is a very long time ago and the last column is the most recent. Units for temperature can be K or C. The CFM uses K, but it will change the temperature to K if you use C.

**"InputFileNamebdot":** Name of the surface mass balance input file. CSV with the same format as temperature. Time steps do not need to be the same as temperature. Units are m ice equivalent *per year*, not for that particular time step. So, if you are using monthly time steps, perhaps it snows 0.05 m (ice) in January 2015. That column of the csv would be:

|  |
| --- |
| 2015.0 |
| 0.6 |

Because annual rate would be 0.05\*12 = 0.6 m i.e. a-1.

**"InputFileNameIso":** Same as input bdot and temp, except the time history of isotope values (per mil) at the surface.

**"InputFileNamerho":** Time series of the surface density. The units are kg m-3.

**"InputFileNamemelt":** Time series of the melt. Units are m i.e. per year (same as SMB)

**"resultsFolder":** folder that will be created and results will be stored in.

**"physRho":** The physics that will be used for the model run.

**"\_physRhoOptions":** A list of all the physics that are available to run. Currently (November 2017): "HLdynamic","HLSigfus","Li2004","Li2011","Helsen2008","Arthern2010S","Arthern2010T","Spencer2001","Goujon2003","Barnola1991","Morris2013","KuipersMunneke2015","Crocus"

**"MELT":** true/false; whether or not to run melt physics.

**"FirnAir":** true/false; whether or not to run firn air physics (i.e. the gas model)

**"AirConfigName":** Name of the .json file that is the configuration file for the gas model.

**"TWriteInt":** Time write interval – how often to save model output. 1 saves every time step; 2 saves every other, 3 saves every 3rd, etc.

**"SeasonalTcycle":** true/false; whether to implement the seasonal temperature cycle (coreless winter as of 11/17).

**"TAmp":** Amplitude of the seasonal temperature cycle, if that option is used (Kelvin).

**"physGrain":** true/false; whether or not to track grain size.

**"calcGrainSize":** true/false (physGrain must be true as well for this to be true); true uses a parameterization to get a surface value and false uses a set grain size at the surface.

"**heatDiff":** true/false; whether to run heat diffusion.

**"variable\_srho":** true/false; variable surface density (true) or not.

**"rhos0":** surface density if variable\_srho is false.

**"r2s0":** initial condition for grain size; used only in firn\_density\_spin

**"AutoSpinUpTime":** true/false. If true, model will attempt to spin up the model for as long as it takes to refresh the entire firn column.

**"yearSpin":** how many years to spin up for.

**"stpsPerYearSpin":** how many time steps per year during the spin up (e.g. 12 is monthly)

**"H":** Thickness of the ice in meters. This is confusing, sort of. But, probably keep it at 3000 or so. That would mean the surface of the firn is 3000 m above the bed.

**"HbaseSpin":** The elevation of the bottom of the model domain above the bed (confusing bit part 2!). So, if you want to model to 250 m depth, and H is 3000, HbaseSpin will be 2750. Likewise, if you wanted to model just the top 50 m of firn, HbaseSpin will be 2950 (assuming H is 3000).

**"stpsPerYear":** steps per year for the model run (probably should always just be the same as stpsPerYearSpin).

**"D\_surf":** The surface value of the layer tracking routine. Defaut 0.

**"bdot\_type":** The type of accumulation rate to use for the densification physics. Instant is the instantaneous value (i.e. at that time step) of accumulation, mean is the mean accumulation over the lifetime of a parcel of firn. (Stress is in progress, 11/17, but will use the stress directly).

**"bdot\_options":** ["instant","mean","stress"] See above.

**"isoDiff":** true/false; whether to run water isotope diffusion

**"iso":** Which isotope to diffuse. (Different isotopes have different diffusivities).

**"\_isoOptions":** ["18","D","NoDiffusion"]; no diffusion means that the isotopes are tracked but do not diffuse (something of a baseline case).

**"spacewriteint":** interval of the spatial nodes to write; 1 is every node; 2 is every other, etc.

**"strain":** true/false; whether to consider longitudinal strain

**"du\_dx":** strain rate if strain is true; a value around 1e-5 is a good guess if you want to play.

**"outputs":** which outputs you want the model to save, e.g.: ["density", "depth", "compaction ","DIP","BCO","temperature","LWC"],

**"output\_options":** ["density", "depth", "temperature", "age", "dcon", "bdot\_mean", "climate", "compaction\_rate", "grainsize", "temp\_Hx", "isotopes", "BCO", "LIZ", "DIP","LWC"],

**"resultsFileName":** name of the results file; default: "CFMresults.hdf5",

**"spinFileName":** name of the spin-up results file; default: "CFMspin.hdf5"

}