

The following supplementary materials are included:

moninq\_v.f: the GFS PBL scheme for the SCM, with modifications as options

shalcnv\_v.f.v2011: the shallow convection scheme for the SCM, with modifications as options

shalcnv\_v.f.vvel: the shallow convection scheme that uses the vertical velocity equation to predict cloud top, which includes other modifications as options.