

MM5 Version 3.7: The Final Version

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Version Releases

- December 2002 – 3.6
 - March 2003 – 3.6.1
 - August 2003 – 3.6.2
 - February 2004 – 3.6.3
- December 2004 – 3.7
 - April 2005 – 3.7.1
 - May 2005 – 3.7.2

New in Version 3.7

- Zängl Diffusion Option (ITPDIF=2)
 - Described in last workshop (Bruyère and Zängl, 2004)
 - Horizontal T and q diffusion made truly horizontal to behave better in narrow valleys
 - TDKORR=1,2 is a further horizontal T diffusion correction option for the surface
 - ITADVMM, IQADVMM=1 are T and q advection options with limiters for better stability with the new diffusion

New in Version 3.7

- Orographic effects on solar radiation at surface (Zängl)
 - LEVSLP=levidn is the coarsest nest level for which this is switched on
 - Topographic slope calculated from resolved elevation modifies solar angle
 - OROSHAW=1
 - non-MPP only
 - Additional allowance for shading of neighboring grid cells by mountains

New in Version 3.7

- MRF PBL Changes

- MRF PBL now works with Polar Physics (sea-ice fraction, ice surface mods) in addition to Eta PBL
- PBL height output changed (only diagnostic not internal PBL height used for computations)
- Surface wind stress in day-time reduced by eliminating convective velocity effect on stress (Y. Liu)
- Convective velocity computation changed to use Beljaars' formulation (Y. Liu)
- 3.7.1 and 3.7.2 included changes to the vertical mixing in the free atmosphere and at the PBL top (G. Thompson)

New in Version 3.7

- Noah LSM Changes (F. Chen)
 - Emissivity effects added (previously assumed $\varepsilon=1$). This affects skin temperature and fluxes slightly, but makes scheme compatible with longwave radiation schemes
 - Urban properties improved (soil heat capacity, and vegetation characteristics)
 - LANDUSE.TBL increase of emissivity of crop/grassland in summer to match measured values better (affects other schemes too)

New in Version 3.7

- Other Changes
 - Grell cumulus scheme uses PBL tendencies in its large-scale forcing now. Improves diurnal convection timing
 - CCM2 shortwave radiation has larger effective ice particle radius, reducing ice-cloud radiative effect (suggestion from U Washington)
 - New Reisner1 optimized version (MPHYSTBL=2)
 - Reisner 2 microphysics updated
 - Schultz microphysics updated
 - Optimization for Cray X1(P. Johnson), IBM (Z. Christides, C. Coates)
 - Compilation flags added for Intel Fortran and Mac xlf
 - Numerous other changes and bug-fixes (see CHANGES file for complete details)

Contributed MM5 Versions

- **Alpine Version (Guenther Zängl)**
 - Diffusion and slope effects (as in 3.7) plus
 - Generalized vertical coordinate
 - Improved upper radiative condition for nests
- **Tracer Version (Shuhua Chen)**
 - 3.6 code plus added passive tracers
 - Generalized to any number of tracers
 - Tracer transports by advection, diffusion, MRF PBL and KF cumulus scheme
- **Global Version (Dudhia and Bresch)**
 - 3.3 (including MPP for IBM and Linux)
 - 3.4 (non-MPP)

[obtain these from mesouser/Misc directory]

Pre- and Post-Processors

- Now with Intel and Mac compiler options
- RIP4 supported (old RIP being replaced)
- REGRID now can handle ERA40 data

The Future of MM5

- 3.7 will be last MM5 version
- Mesouser e-mail, ftp, and Web-page support continues
- Last MM5 Tutorial class was in January 2005
- Online (web) MM5 Tutorial improved
- This 15th Annual Workshop is the final one for MM5

Transition to WRF

Several efforts making transition easier

- MM5-WRF pressure-level conversion program (see W. Wang talk)
- Nesting already in WRF (moving nests coming, J. Michalakes talk)
- FDDA coming (D. Stauffer, Liu et al.)