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Tests with the Kain-Fritsch convection scheme

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first results: update

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Last year's plans and where we are today . . .

- consolidated first version by the end of 2001

  ⟶ Kain-Fritsch scheme available as optional convection scheme since LM version 2.17
  ⟶ (submitted December 2001, released May 2002)

- further case studies to explore potential of the scheme

  ⟶ Started. — However: detection of two major bugs in the interface by late August . . .

- tuning of free parameters

  ⟶ Minimal.

- parallel runs

  ⟶ No.

- operational version by the beginning of the next convective season

  ⟶ No. — Sorry . . .

Case studies

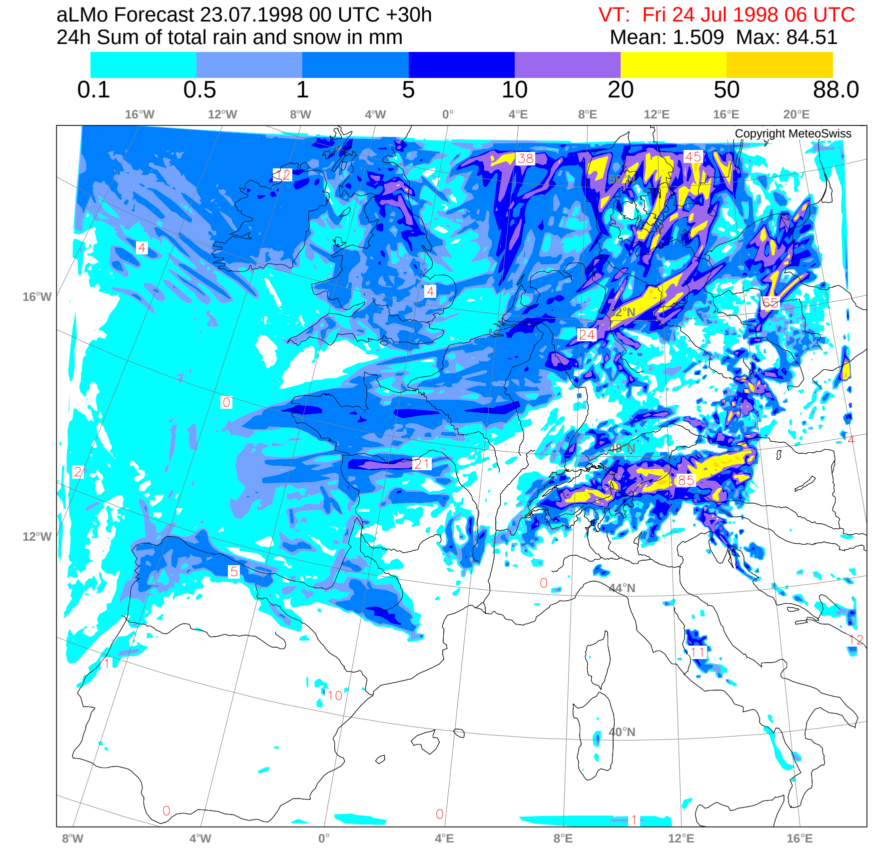
Air mass convection (23.07.1998), MAP IOP 2a and 2b

- LM version 2.17
- operational aLMo settings (*i.e.*, domain, namelist parameters, *etc.*)
- initial and boundary conditions: IFS 4d-VAR analysis (3-hourly boundary conditions)
- averaging of forcing fields: T, q_v, u, v and w for Kain-Fritsch

Air mass convection, 23.07.1998

24h sum of total rain and snow in mm

Kain-Fritsch scheme:



aLMo Forecast 23.07.1998 00 UTC +30h
24h Sum of total rain and snow in mm

VT: Fri 24 Jul 1998 06 UTC
Mean: 1.509 Max: 84.51

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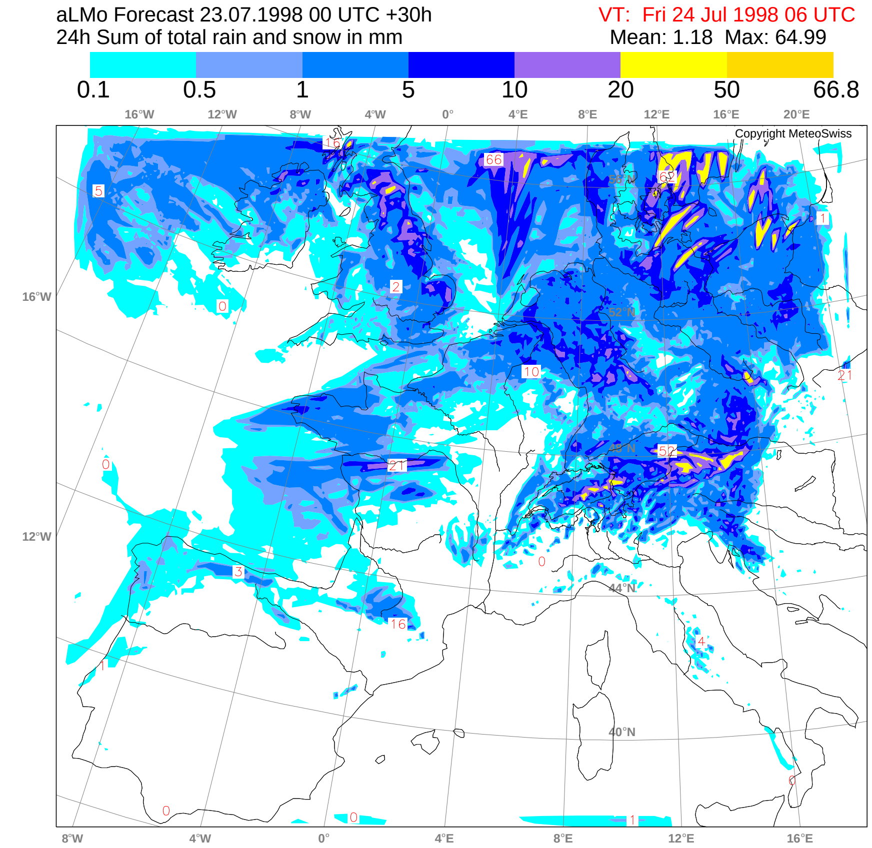
MAGICS 5.5 terra - arpagaus Tue Sep 10 22:37:35 2002 019

Tiedtke scheme:



aLMo Forecast 23.07.1998 00 UTC +30h
24h Sum of total rain and snow in mm

VT: Fri 24 Jul 1998 06 UTC
Mean: 1.18 Max: 64.99

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MAGICS 5.5 terra - arpagaus Fri Aug 23 12:03:02 2002 020

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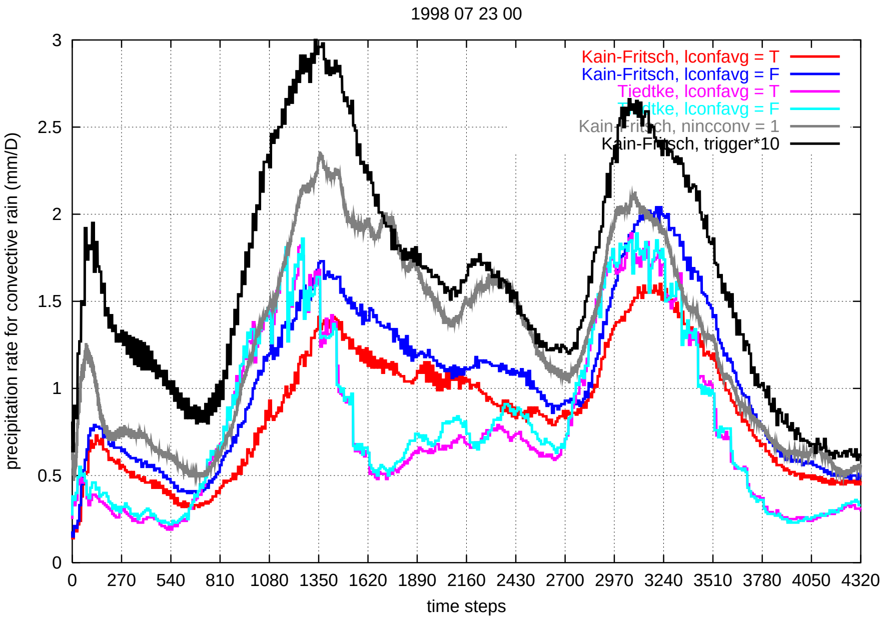
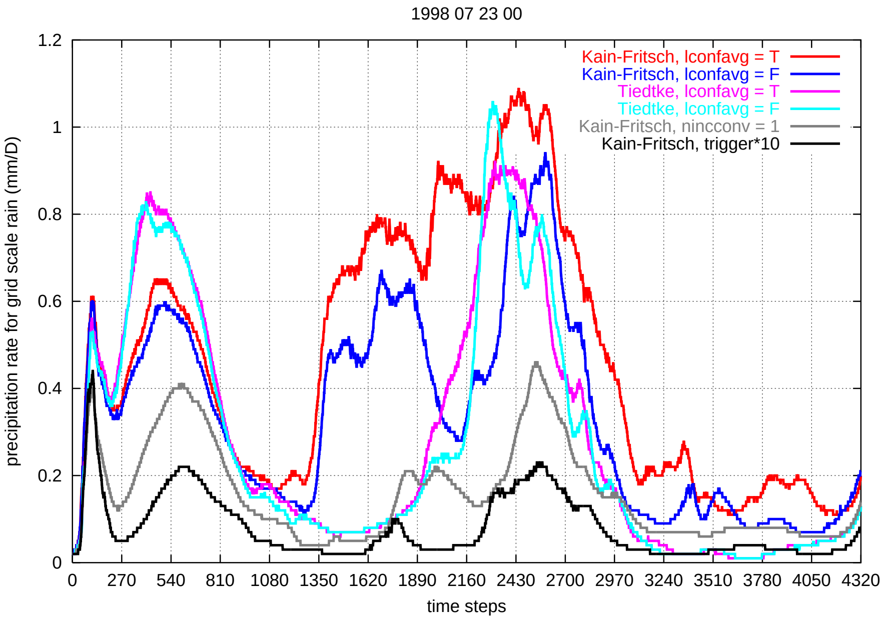
Air mass convection, 23.07.1998

convective and stratiform precipitation, averaged over full aLMo domain

precipitation rate for convective rain:



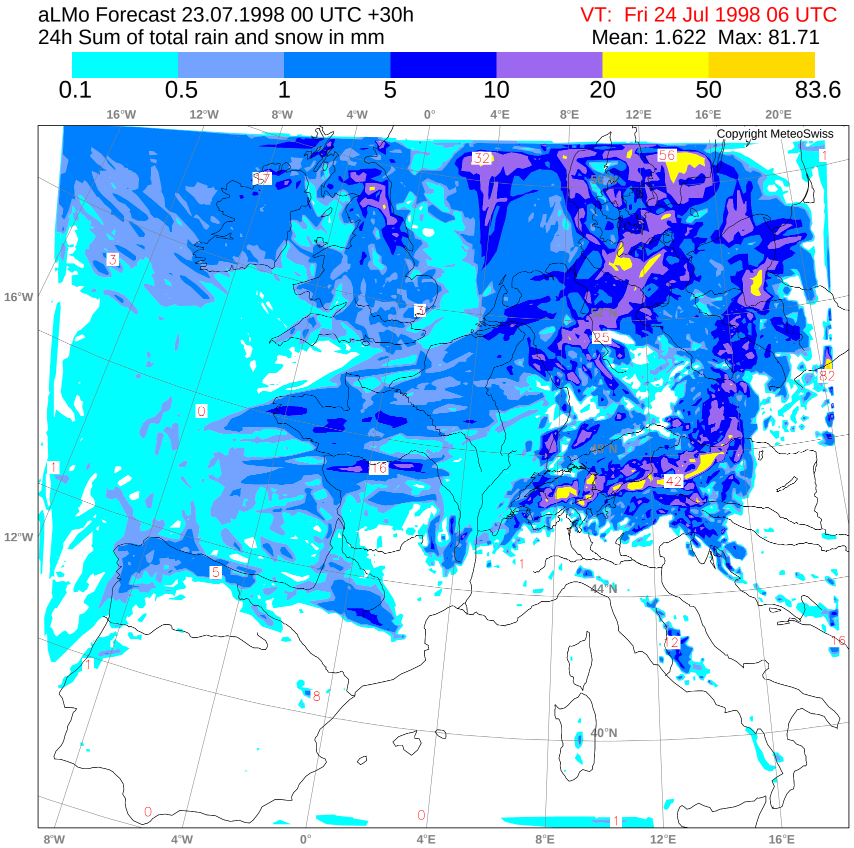
precipitation rate for grid scale rain:



Air mass convection, 23.07.1998

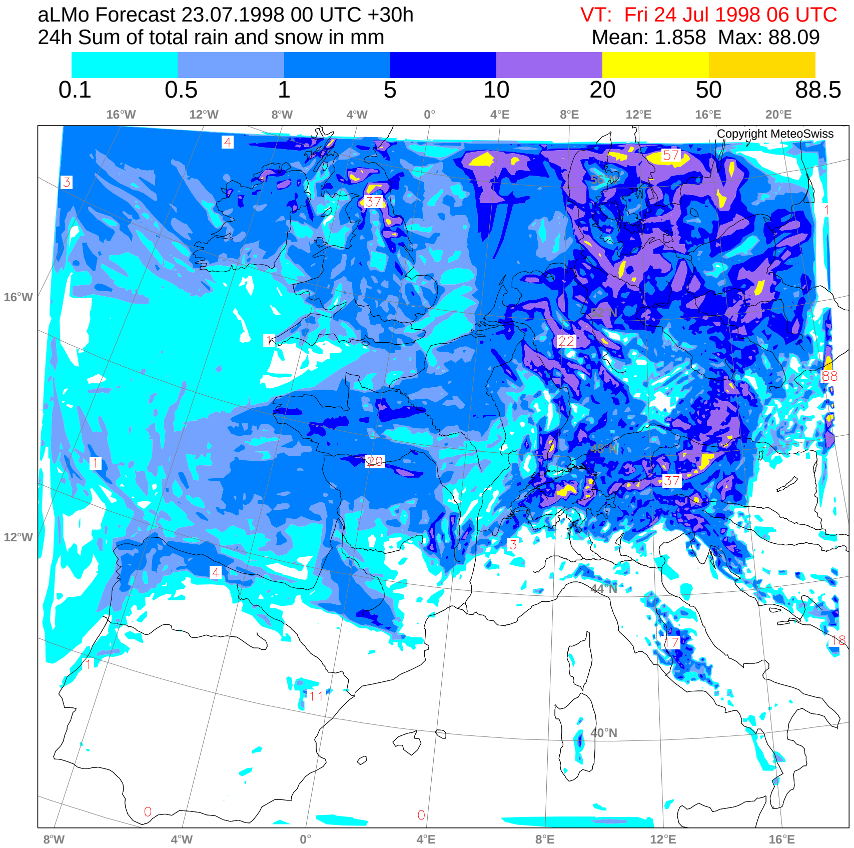
24h sum of total rain and snow in mm

Kain-Fritsch scheme, nincconv = 1:



MAGICS 5.5 terra - tsm Fri Sep 20 21:51:39 2002 kf2

Kain-Fritsch scheme, enhanced trigger rate:



MAGICS 5.5 terra - arpagaus Sun Sep 22 16:32:42 2002 026

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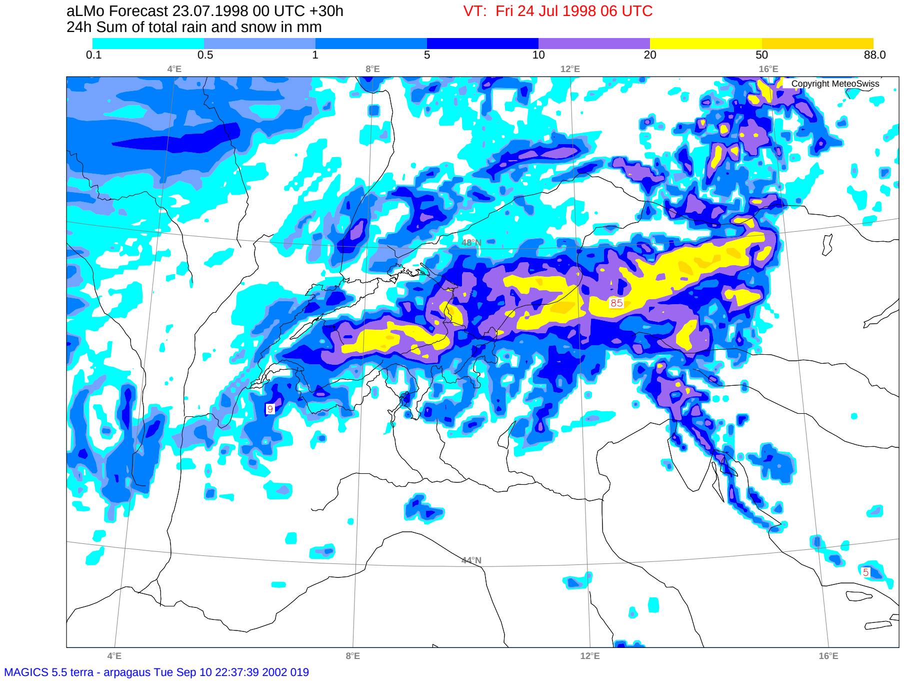
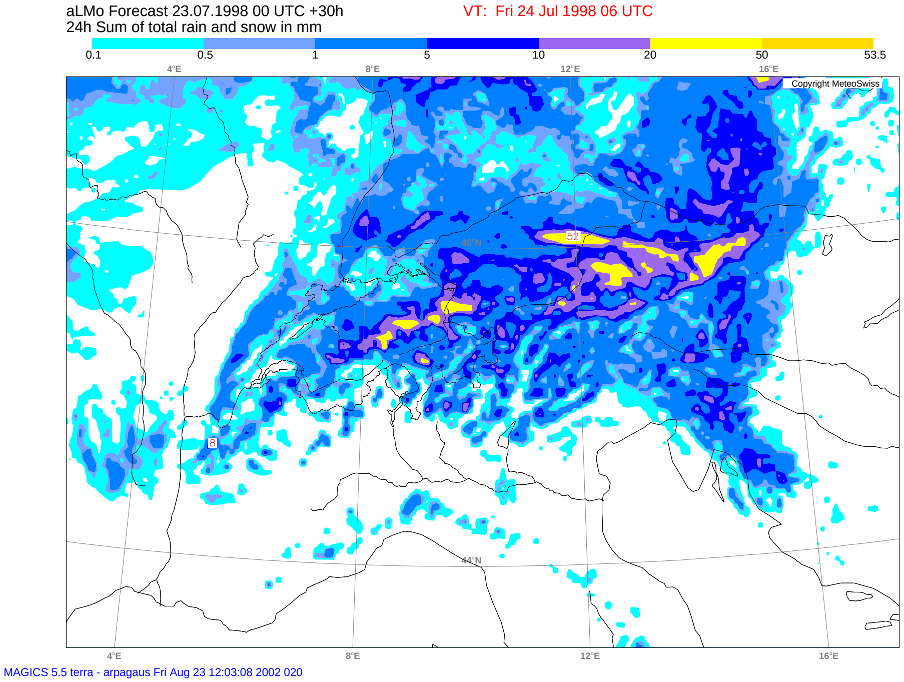
Air mass convection, 23.07.1998

24h sum of total rain and snow in mm

Kain-Fritsch scheme:



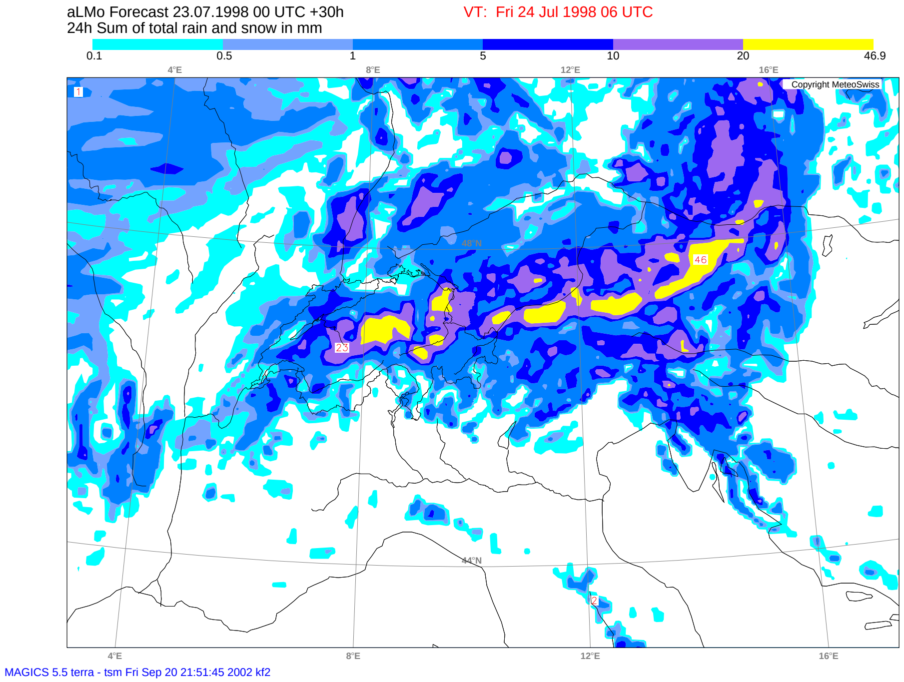
Tiedtke scheme:



Air mass convection, 23.07.1998

24h sum of total rain and snow in mm

Kain-Fritsch scheme, nincconv = 1:



Kain-Fritsch scheme, enhanced trigger rate: