

Table 1. The experiments for testing oscillations in LMDZOR (revised soilthermo)

	soil thermo	step phys.	step rad.	lwdown (pbl)	lwup (enerbil)	cdrag	CRE	Results
CTL	old	7.5 mn	1hr	new	new	default	default	
<b>EXP1</b>	new	7.5 mn	1hr	new	new	default	default	Figs. 1-6 (CTL, EXP1-2): general tests. oscillations when rad. is called; over humid regs; vertical profiles fine.
<b>EXP2</b>	new:no conv.	7.5 mn	1hr	new	new	default	default	
EXP3	old	7.5 mn	7.5 mn	old	old	default	default	Figs. 7-12 (CTL, EXP3-4): rad. step tests; oscillations with 7.5 mn rad (humid regs) in both CTL and EXP.
EXP4	new	7.5 mn	7.5 mn	old	old	default	default	
<b>EXP5</b>	new	7.5 mn	15 mn	old	old	default	default	Figs. 13-16 (EXP4-6): oscillations with 15 mn & 30 mn rad. step (humid regions).
<b>EXP6</b>	new	7.5 mn	30 mn	old	old	default	default	
EXP8	new	7.5 mn	7.5 mn	old	old	default	0	Fig. 27 (EXP1,7,4,8): if rad. 7.5 mn, oscillations removed with CRE=0; if rad. 1hr, oscillations not removed with CRE=0.
<b>EXP7</b>	new	7.5 mn	1hr	new	new	default	0	Figs. 17-18 (EXP1,7,9): lwup almost no impacts on oscillations.
<b>EXP9</b>	new	7.5 mn	1hr	new	old	default	0	
<b>EXP10</b>	new	7.5 mn	1hr	new	new	0.01	0	Figs. 19-20 (EXP7,9-13): cdrag tests (CRE excluded). (1) low cdrag(e.g., 0.01): oscillations removed; (2) High cdrag (0.02), oscillations when radiation is called.
<b>EXP11</b>	new	7.5 mn	1hr	new	old	0.01	0	
<b>EXP12</b>	new	7.5 mn	1hr	new	new	0.2	0	
<b>EXP13</b>	new	7.5 mn	1hr	new	old	0.2	0	
<b>EXP14</b>	new	7.5 mn	1hr	new	old	0.2	default	Figs. 21-22 (EXP1,14,15): cdrag tests (CRE included).
<b>EXP15</b>	new	7.5 mn	1hr	new	new	0.2	default	
<b>EXP16</b>	new	7.5 mn	7.5 mn	new	old	default	default	Figs. 23-24 (EXP1,16-18): rad. step tests; if rad. 7.5 mn, oscillations are not from lwdown, lwup or cdrag.
<b>EXP17</b>	new	7.5 mn	7.5 mn	new	new	default	default	
<b>EXP18</b>	new	7.5 mn	7.5 mn	new	old	0.2	default	
EXP19	new	7.5 mn	1hr	new	new	default	default	Figs. 25-26 (EXP19-22): lwdown & lwup tests. If rad. 7.5 mn, stronger oscillations with old lwdown; lwup effect is small; not removed by lwdown.
EXP20	new	7.5 mn	1hr	new	old	default	default	
EXP21	new	7.5 mn	1hr	old	new	default	default	
EXP22	new	7.5 mn	1hr	old	old	default	default	
<b>Notes</b>	<p>(1) lwdown (in pbl_surface_mod, lwdown value used by ORC): old: sollw_m(i) + RSIGMA*ztsol(i)**4; new: lwdown_m(i) (from radlsw)</p> <p>(2) lwup or 4sigmaT3: old: the lwup is updated every 7.5 mins (according to ORC default TSURF computation); new: the lwup is updated only when rad. is called (1 hr). in enerbil_surftemp (variable 'netrad_sns'): old: zicp(ji) * quatre * emis(ji) * c_stefan * ((zicp(ji) * psold(ji))**3); New: 0.0 in enerbil_begin (variable 'netrad(:)': old: lwdown(:) + swnet(:) - (emis(:) * c_stefan * temp_sol(:)**4 + (un - emis(:)) * lwdown(:)); New: lwnet(:) + swnet(:)</p> <p>(3) CRE: cloud radiative effects.</p>							
<b>Conclusions</b>	<p>1. When the radiation is called every hour, the oscillations originates from the CDRAAG and the coupling with the atmospheric PBL.</p> <p>2. When the radiation is called every time step, the oscillations that may appear originate from the cloud and the PBL schema.</p> <p>3. The lwup has almost no impacts on the oscillations; the oscillations are alleviated with lwdown (new). but they are not removed.</p>							