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# Processes controlling the seasonal variations in $^{210}$Pb and $^{7}$Be at the Mt. Cimone WMO-GAW global station, Italy: a model analysis

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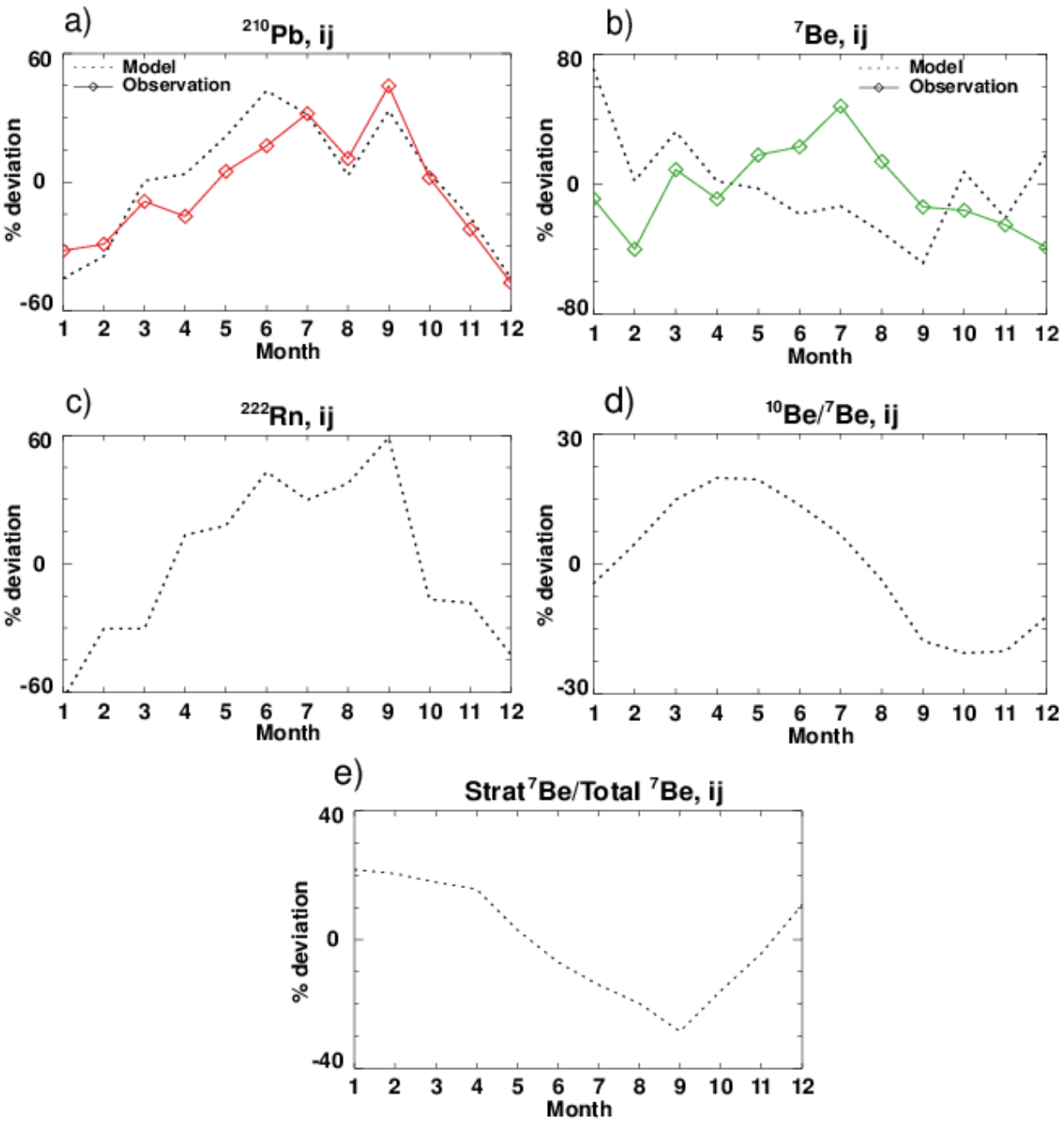
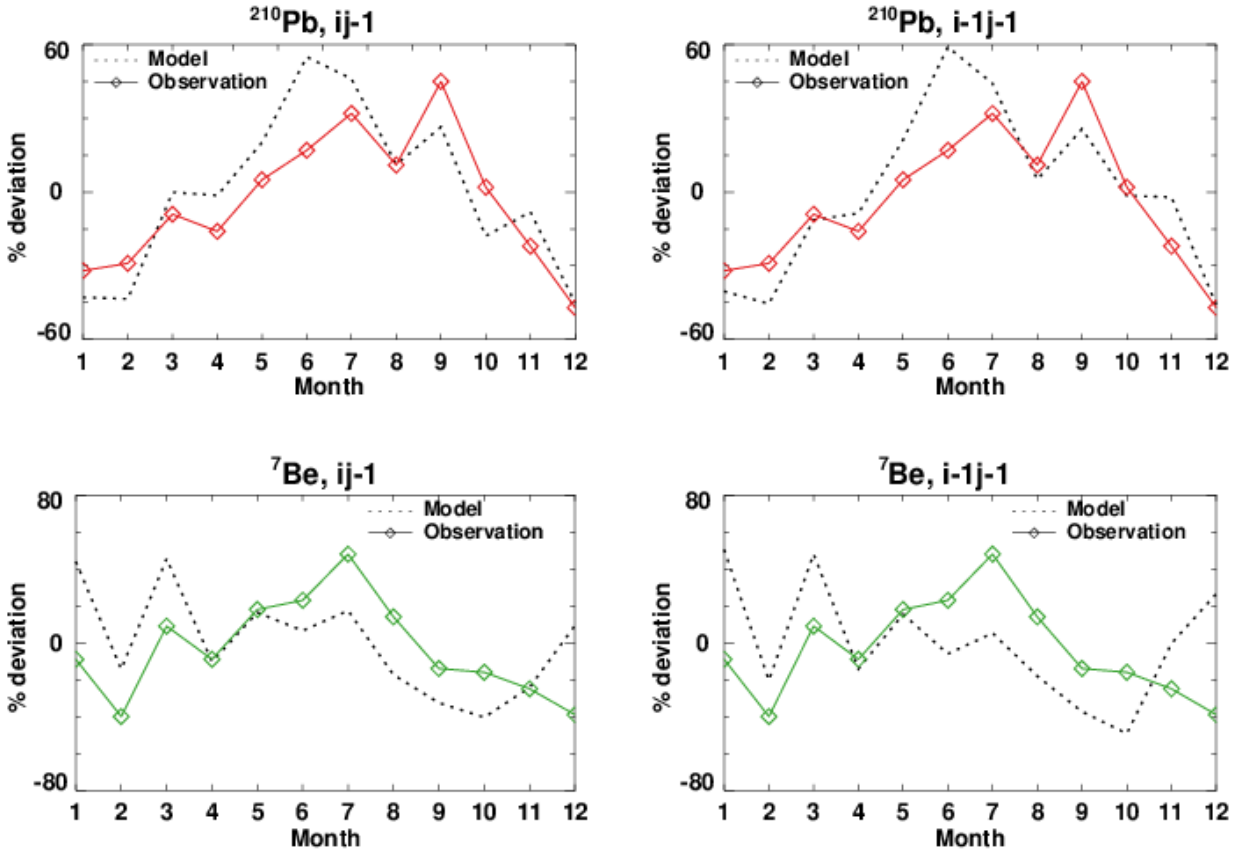
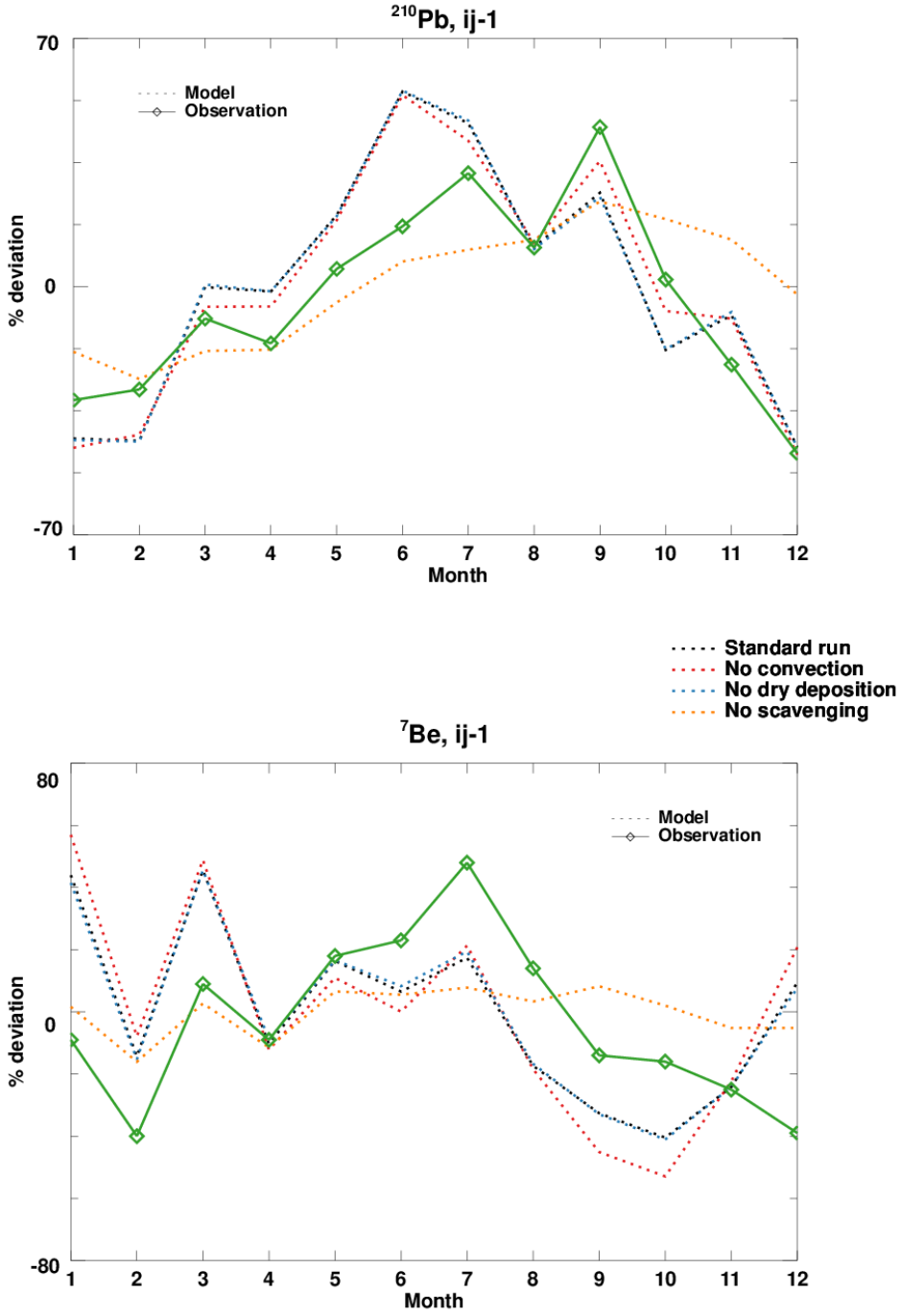
**Supplementary Material**



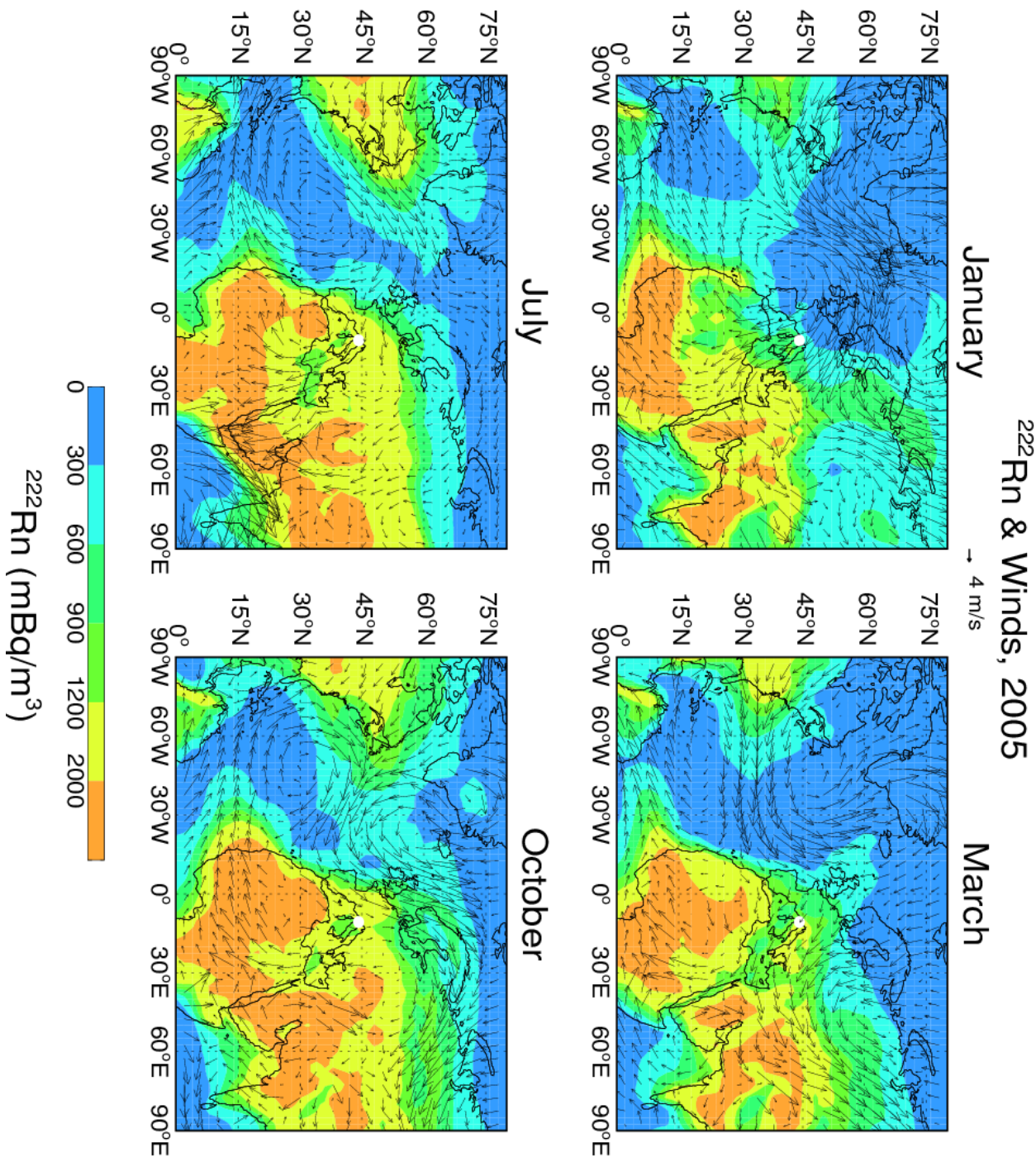

**SI Figure 1 (a,b,c,d,e).** Comparison of GMI simulated (black dotted line) percentage deviations from the annual means of (a) $^{210}$Pb and (b) $^{7}$Be concentrations with those observed at Mt. Cimone (solid lines). Model values are for the "ij" gridbox corresponding to the location of Mt. Cimone. Also shown are GMI simulated monthly fluctuations of (c) $^{222}$Rn activities, (d) $^{10}$Be/$^{7}$Be ratios and (e) strat $^{7}$Be/total $^{7}$Be ratios.



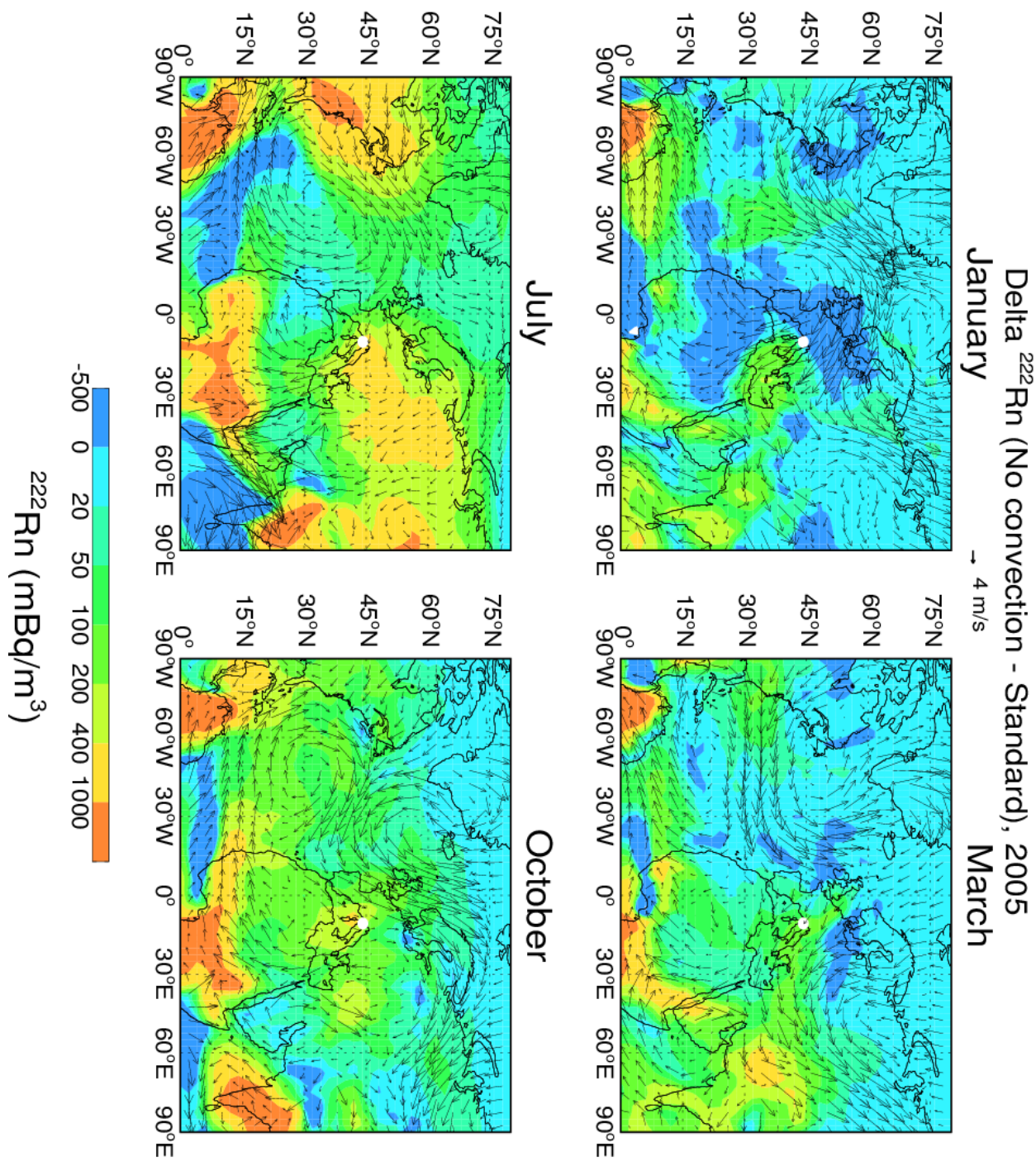

**SI Figure 2.** Same as SI Figure 1(a, b), but for the "ij-1" grid to the south of Mt. Cimone (left column) and the "i-1j-1" grid to the southwest of Mt. Cimone (right column), respectively.




**SI Figure 3.** Comparison of GMI simulated monthly percentage fluctuations of $^{210}$Pb and $^{7}$Be at Mt. Cimone ("ij-1" grid) between the standard (black dotted line) and the sensitivity runs. The sensitivity runs are those without convective transport/scavenging (red dotted line), without dry deposition (blue dotted line), and without scavenging (orange dotted line). The observations are shown as green solid line.




**SI Figure 4.** Simulated monthly mean $^{222}$Rn concentrations, at the elevation of Mt. Cimone. Arrows represent the seasonality of winds in the MERRA meteorological data. The white dot indicates the location of Mt. Cimone (44°12' N, 10°42' E, 2165 m asl).




**SI Figure 5.** GMI simulated differences of $^{222}$Rn concentrations at the elevation of Mt. Cimone between a sensitivity run without convection and the standard run. Arrows denote MERRA winds. The white dot indicates the location of Mt. Cimone (44°12' N, 10°42' E, 2165 m asl).