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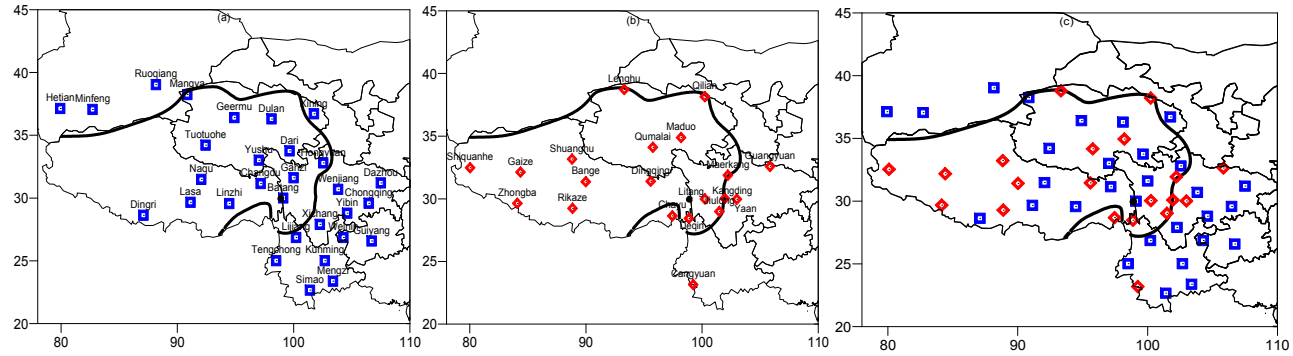

Fig. 1. The (a) OLD, (b) NEW, and (c) OLDNEW layout distribution over the Tibetan Plateau and its nearby area. The solid black line represents 2700 m altitude. The OLD was the layout distribution of existing observation station; the NEW was the layout distribution of planned observation station.

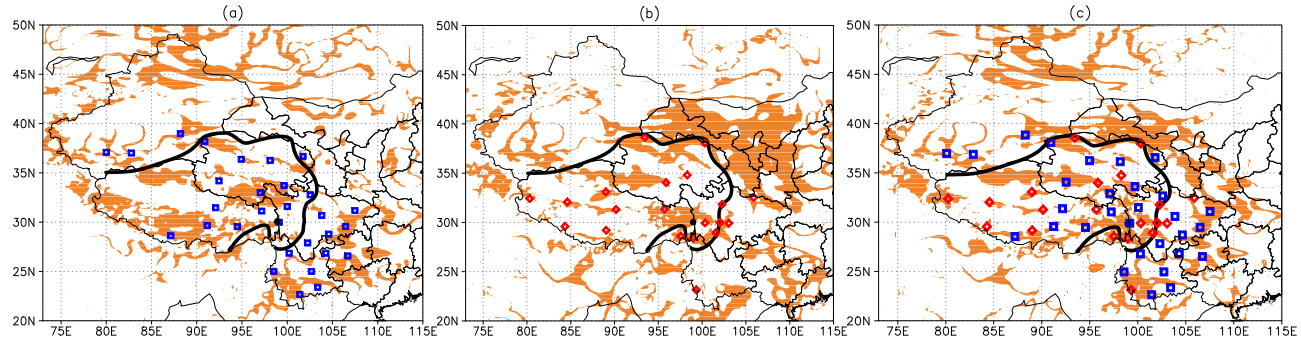

Fig. 2. The improved areas (orange-shading, RC-RE > 0) and layout points of the (a) OLD, (b) NEW, and (c) OLDNEW layout tests. RC is the root square mean error between the OLD, NEW ,OLDNEW runs and control run, respectively. RE is the root square mean error between the nature run (ECMWF analysis) and the runs with observation added.

- The rationality and regional representation of the layout of the upper-air observation system and their actual significance were studied over the Tibetan Plateau and neighboring areas based on An Observing System Simulation Experiment (OSSE).
- For the different layouts over the Tibetan Plateau and neighboring areas (Fig. 1), there were significant differences of winds, temperature, relative humidity and heights in prediction. The layout with both existing and planned observation stations was better than the ones with only existing or only planned stations in terms of forecast accuracy, especially around the areas with new observations added (Fig. 2).
- It also validated the layout of the observations and indicated the necessity to add planned observations over the Tibetan Plateau and neighboring areas.