Implementing downscaling algorithm in external coupler for the coupled modeling platform ParFlow-CLM-COSMO.

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A coupled modeling system integrating the atmosphere with land-surface and groundwater components has become one of the key tools to understand the patterns and structures in land-atmosphere interactions. The COSMO-DE (Consortium for Small Scale Modeling model; configuration for Germany is currently running with a resolution of 2.8 km but ParFlow and CLM (Community Land Model) are intended to be run at much higher resolution of 100m to capture the land-surface heterogeneity and ground-water flow. This scale mismatch between the atmosphere system and the land-surface system requires the use of downscaling/upscaling algorithms. The objective of this study is to implement such downscaling algorithm developed under the TR32 (Transregional Collaborative Research Centre 32) project in the external coupler OASIS3 which passes the end-point data between the COSMO-DE and CLM.