Precipitation modeling in Europe and South-Asia
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INTRODUCTION
Simulations from current GCMs feature a grid resolution of about 2°. Thus, a downscaling to a grid resolution of 0.5° or less is necessary to assess regional precipitation patterns. These are for instance important for investigations on climate predictions of the water balance or of heavy precipitation changes.

APPROACH
- Dynamical downscaling of ERA40 data with the regional climate model CLM (0.44° grid spacing) in a South-Asian and a European domain (Fig. 1)
- Comparison to two statistical downscaling methods with focus on daily precipitation in the upper Brahmaputra and the upper Danube river basin (UBRB and UDRB, respectively)
- Application of two statistical bias correction methods (cf. Dobler and Ahrens, 2008)

RESULTS
- The CLM underestimates the monthly precipitation from July to September in the UDRB (Fig. 2) as well as in the UBRB (Fig. 3)
- In the UBRB, this especially applies to the subregion Assam (Fig. 4), but not to the subregion Tibet (Fig. 5)
- Application of two statistical bias correction methods (cf. Dobler and Ahrens, 2008)

RESULTS (continued)
- The East Asia daily precipitation data set (EAD, cf. Xie et al. 2007) and station data in Assam show major differences (Fig. 4)
- Good agreement of the EAD and station data in Tibet (Fig. 5) as well as of the CRU data set (Mitchell and Jones, 2005) and station data in the UDRB (Fig. 2)

CONCLUSIONS
While the CLM and the bias correction methods work well in Europe, there are some challenges in South-Asia:
- A high seasonal variability of the CLM bias deteriorates the bias correction methods in the UBRB
- The CLM bias uncertainties in the UBRB from November to January are relatively large due to a small number of rain days (Dobler and Ahrens, 2008)
- Bad performance of the CLM especially in a region facing large Monsoon driven precipitation events (i.e., Assam) where the major part of precipitation is simulated by the Tiedtke (1989) convection scheme

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