

# **Evaluation of climate patterns in a regional climate model over Italy using long-term records from SYNOP weather stations and cluster analysis**

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**Supplement.**

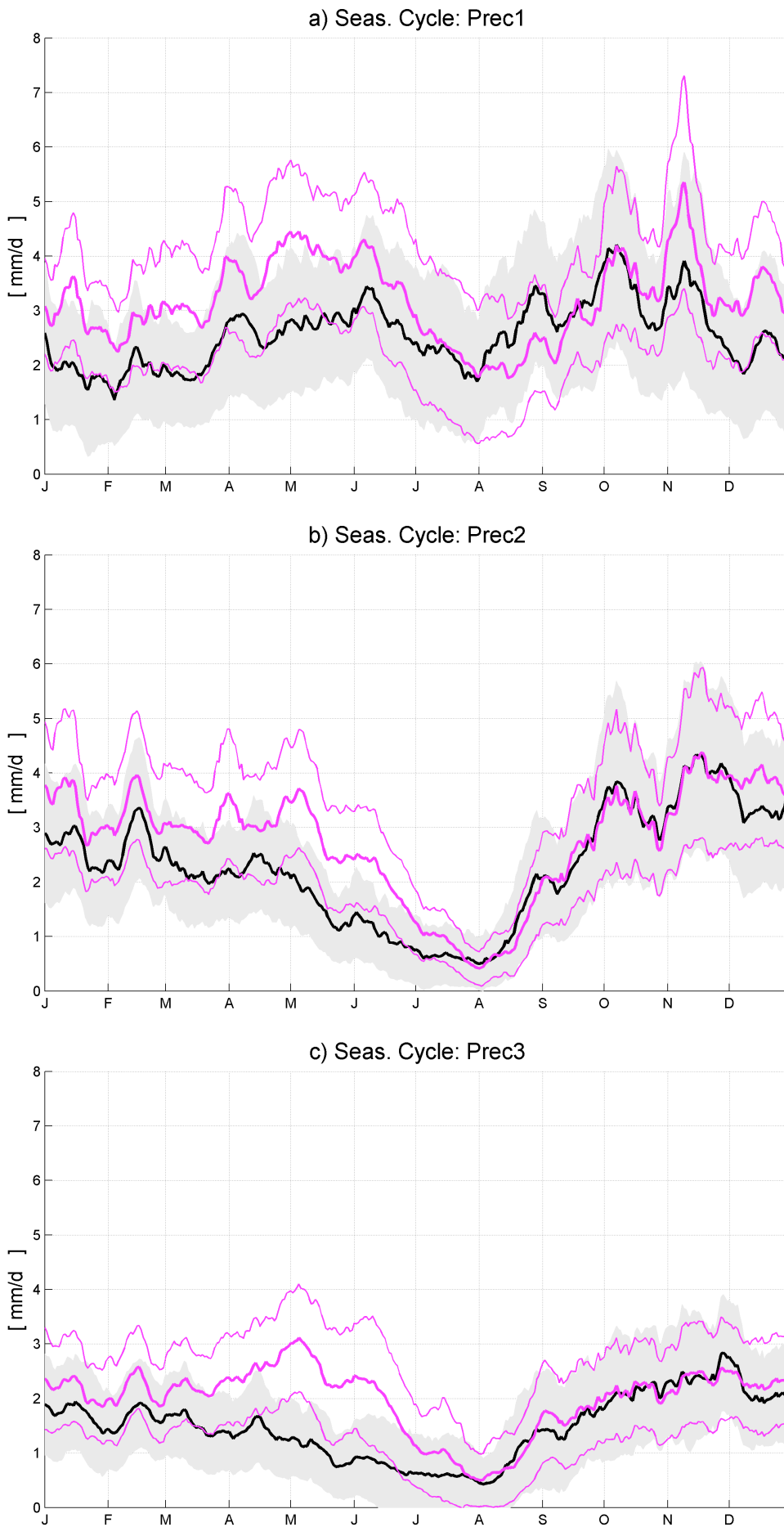


Fig. S1. Seasonal cycle of Precip. over the 3 observed clusters reported in Fig. 3a. The thick black lines represent the mean seasonal cycle for the weather station data. The range ( $\pm 1$  std) of spatial variability of weather station data within the cluster is reported as grey shaded regions. The thick magenta lines are for the mean seasonal cycle as reproduced from the model output of the PROTHEUS simulation over the same clusters. The thinner line are for  $\pm 1$  std. To filter out the highest frequency noise we apply a 5 days running mean to the time series

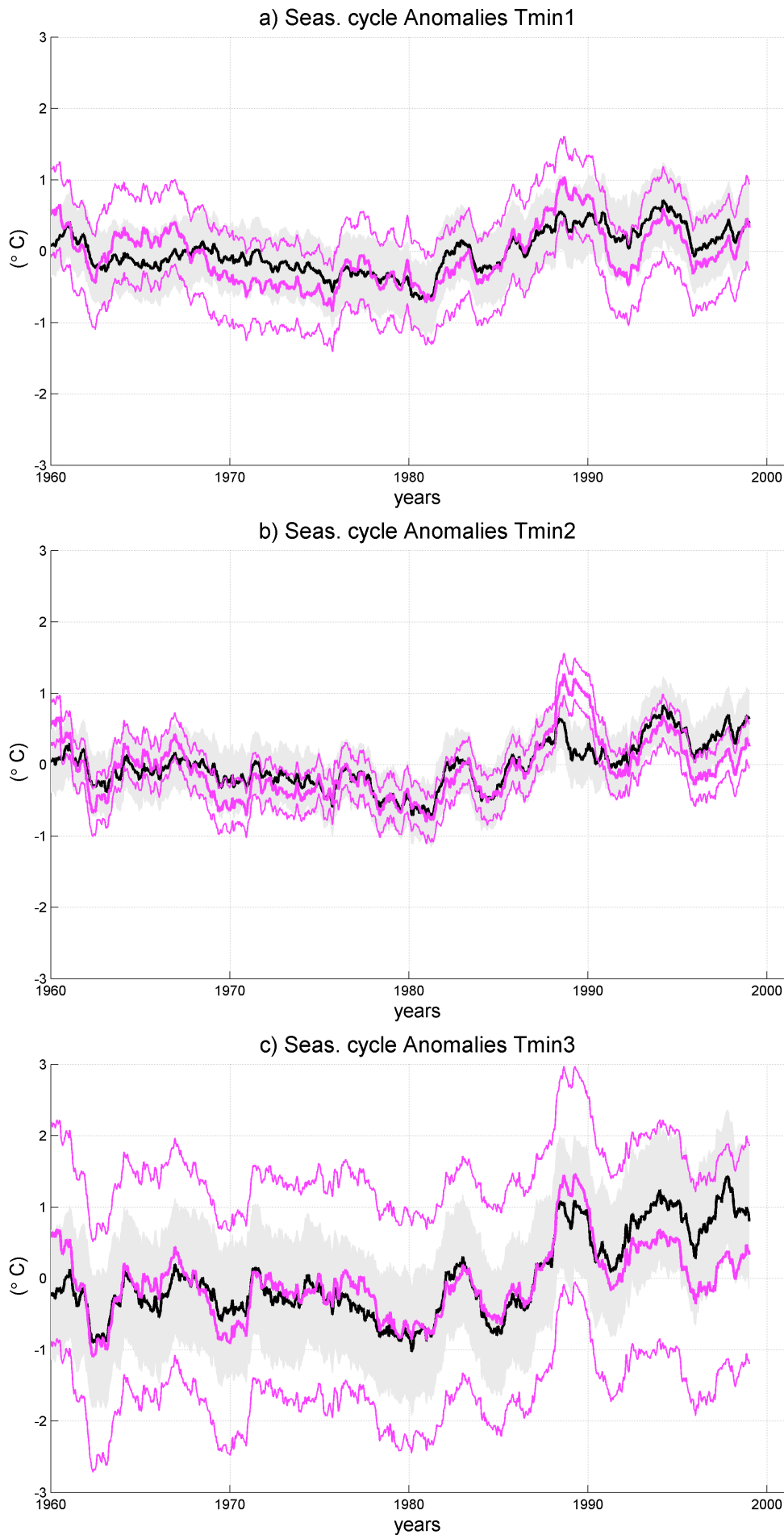
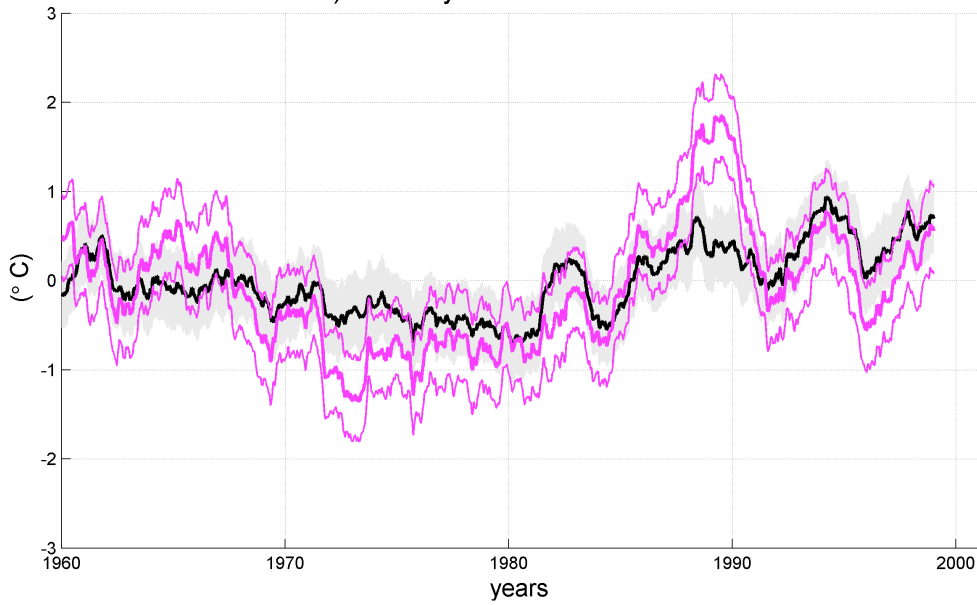
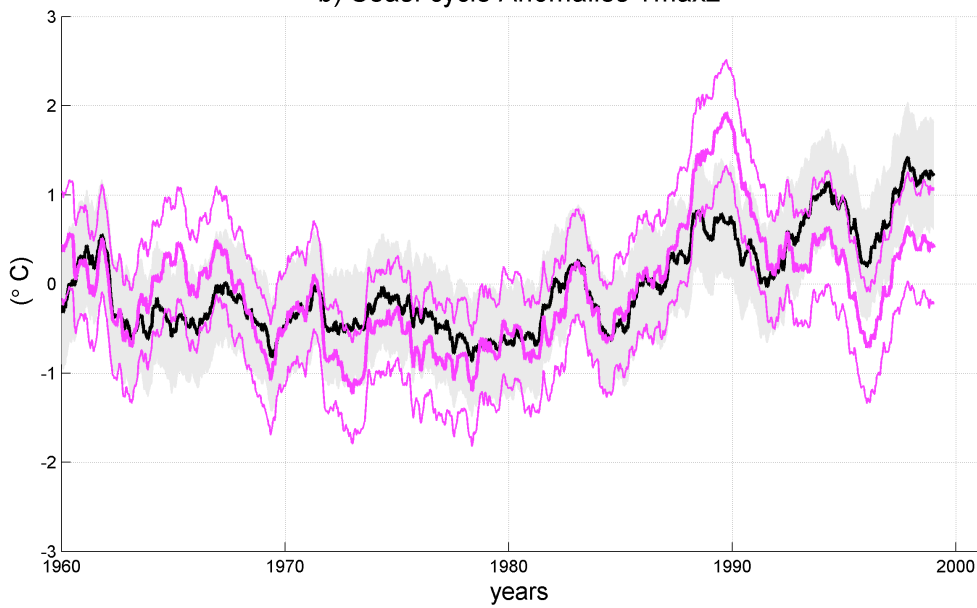


Fig. S2. Time series of deviations from the mean seasonal cycle for  $T_{\min}$  over the observed 3 clusters reported in Fig. 3a: as in Fig. 4, the black thick lines are for the mean values over each clusters as represented by the weather station data. The range ( $\pm 1$  std) of spatial variability of weather station data within the cluster is reported as grey shaded regions. The magenta thick lines are the corresponding values from model output of the PROTHEUS simulation over the same clusters. The thinner line are for  $\pm 1$  std

a) Seas. cycle Anomalies Tmax1



b) Seas. cycle Anomalies Tmax2



c) Seas. cycle Anomalies Tmax3

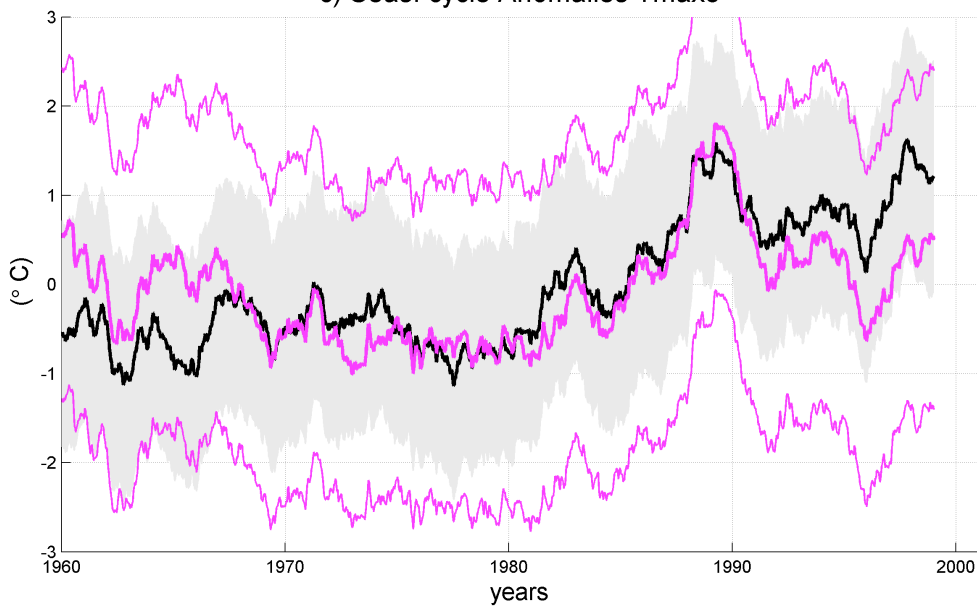


Fig. S3. As in Fig. S2, but for  $T_{\max}$

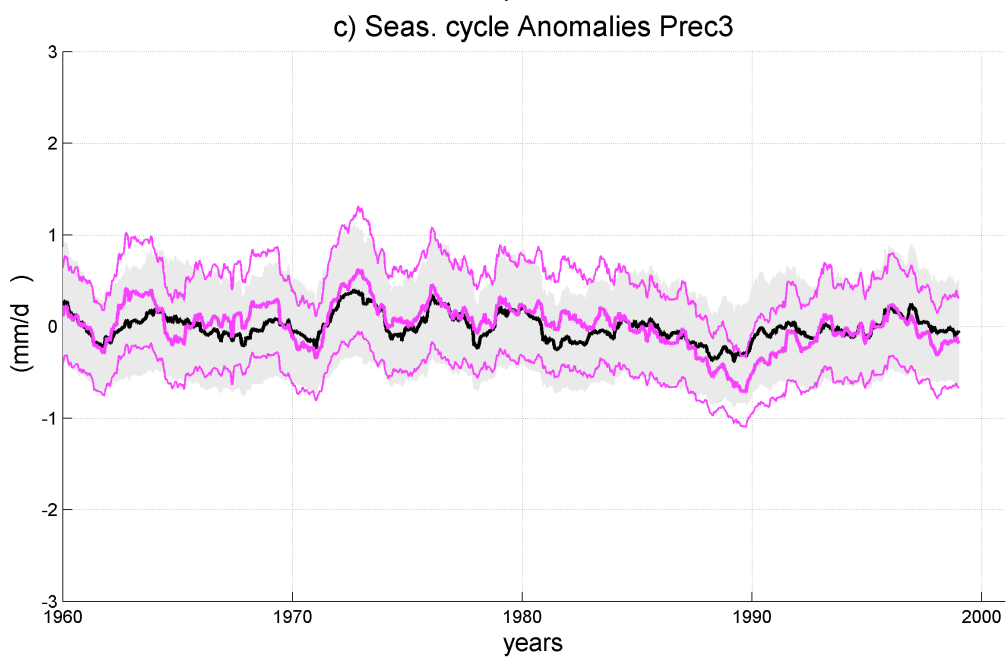
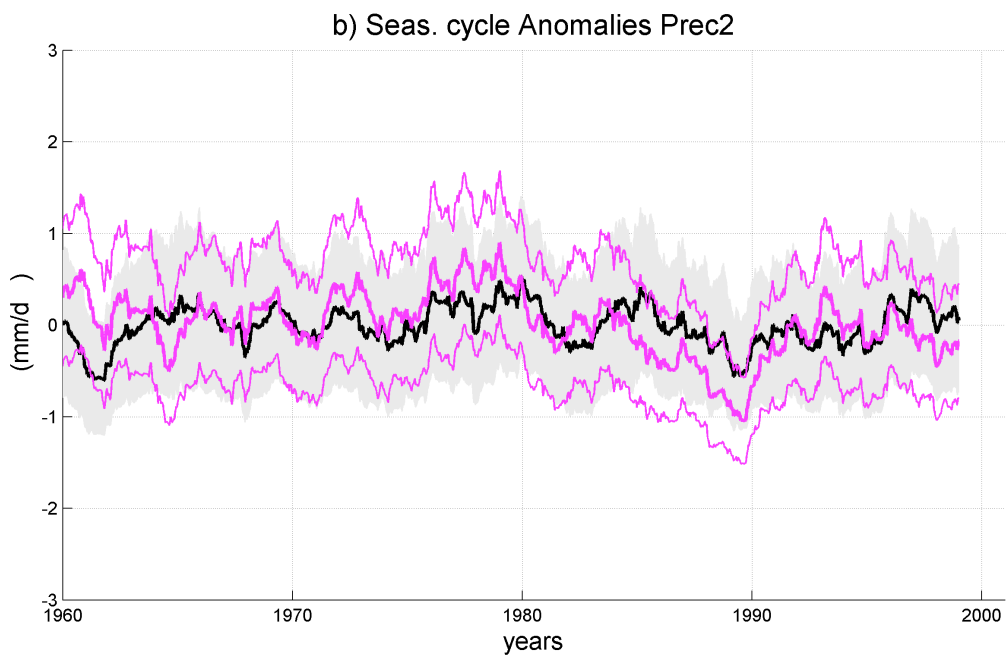
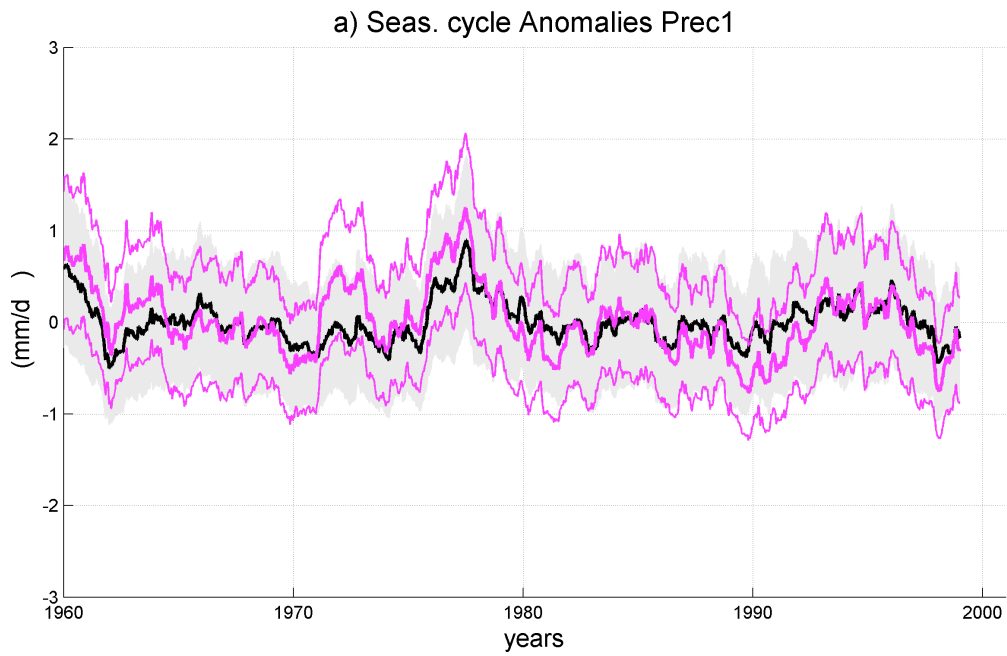


Fig. S4. As in Fig. S2, but for  $P_{\text{recip}}$