

## **SUPPORTING INFORMATION**

### **Lagrangian process attribution of isotopic variations in near-surface water vapour in a 30-year regional climate simulation over Europe**

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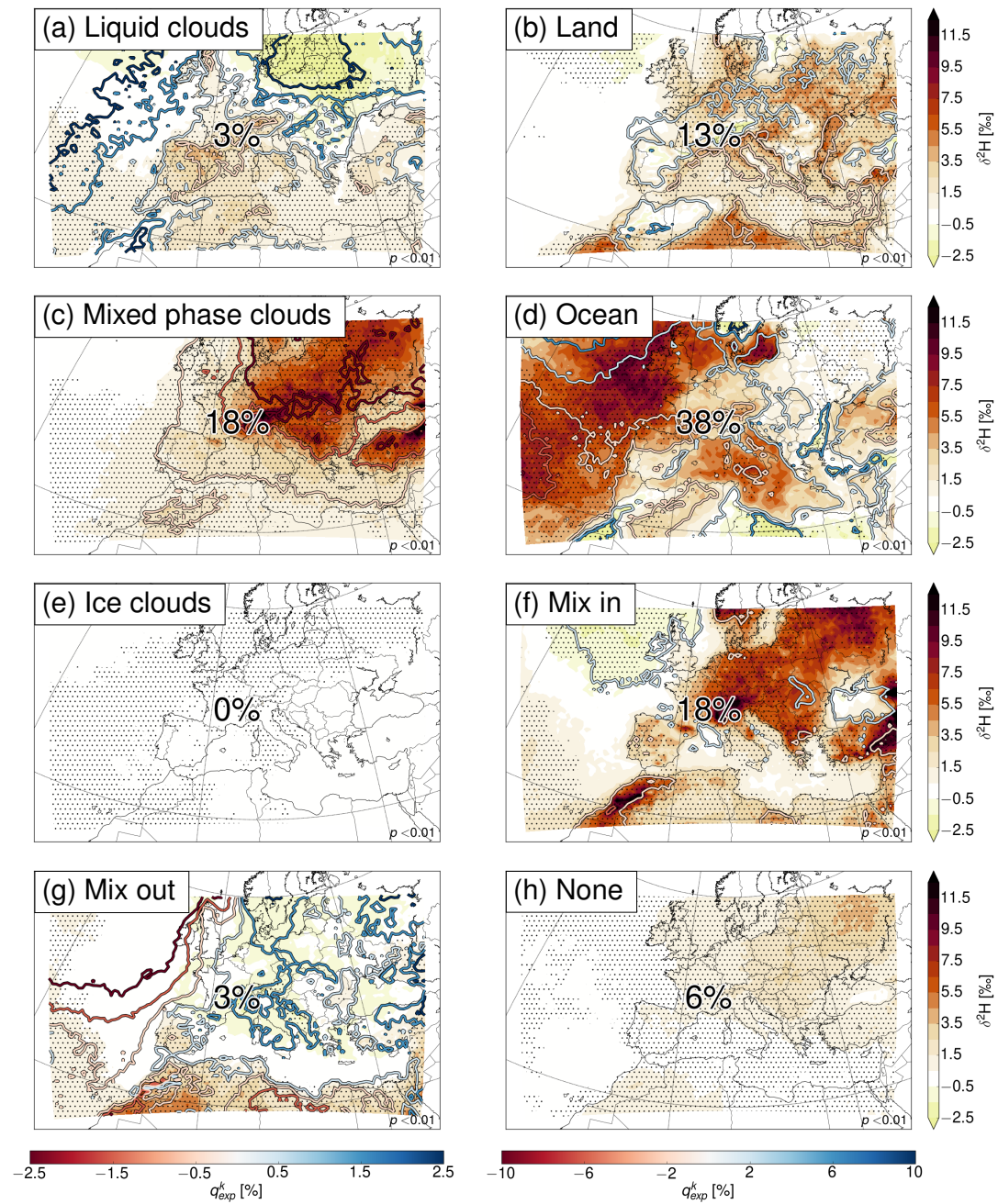
- Figures S1 to S4

#### **Description**

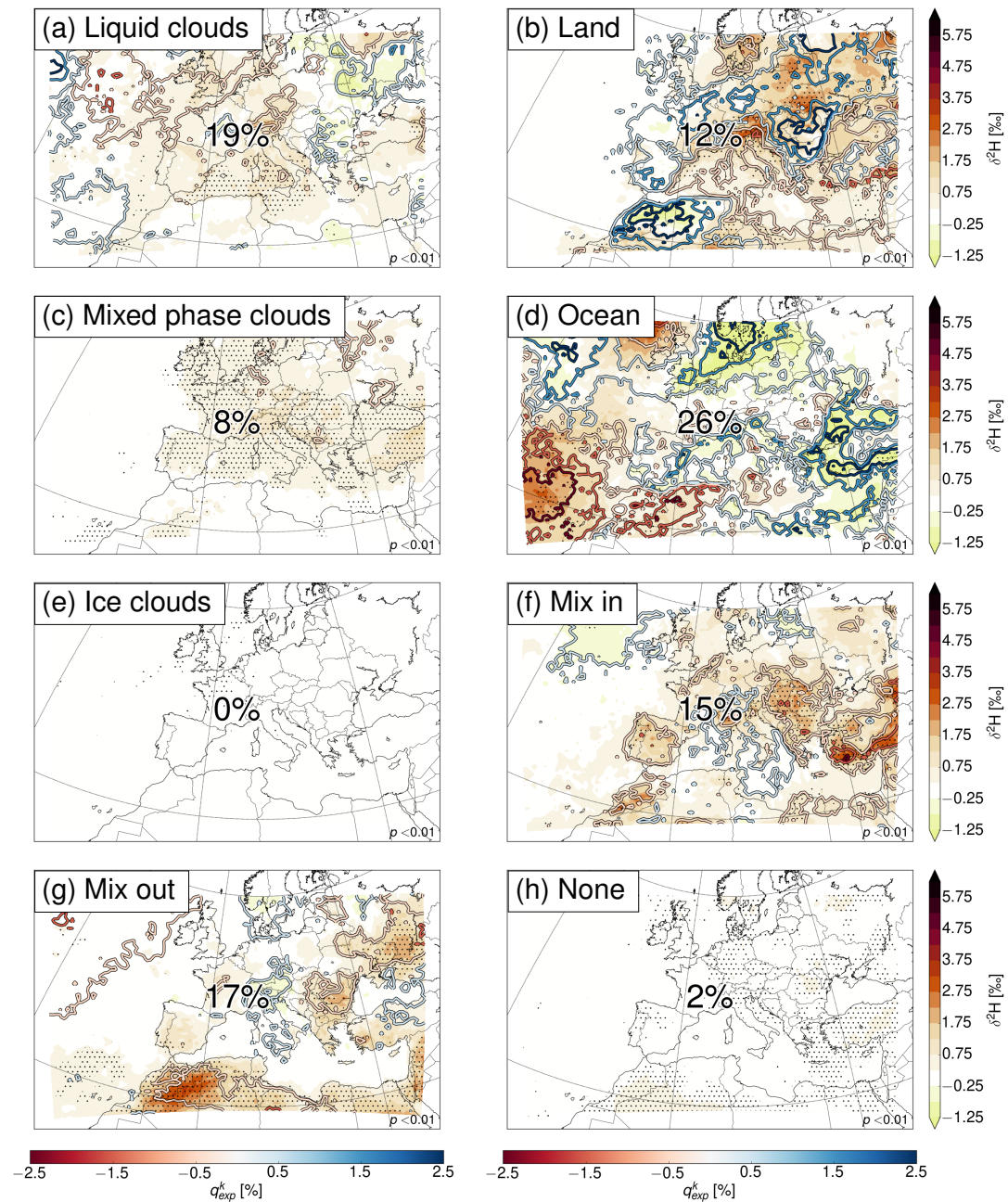
- Figures S1 and S2 show the contributions of the processes to the monthly and yearly anomalies of  $\delta^2\text{H}$
- Figures S3 and S4 show the contributions of the processes to the monthly and yearly anomalies of deuterium excess.

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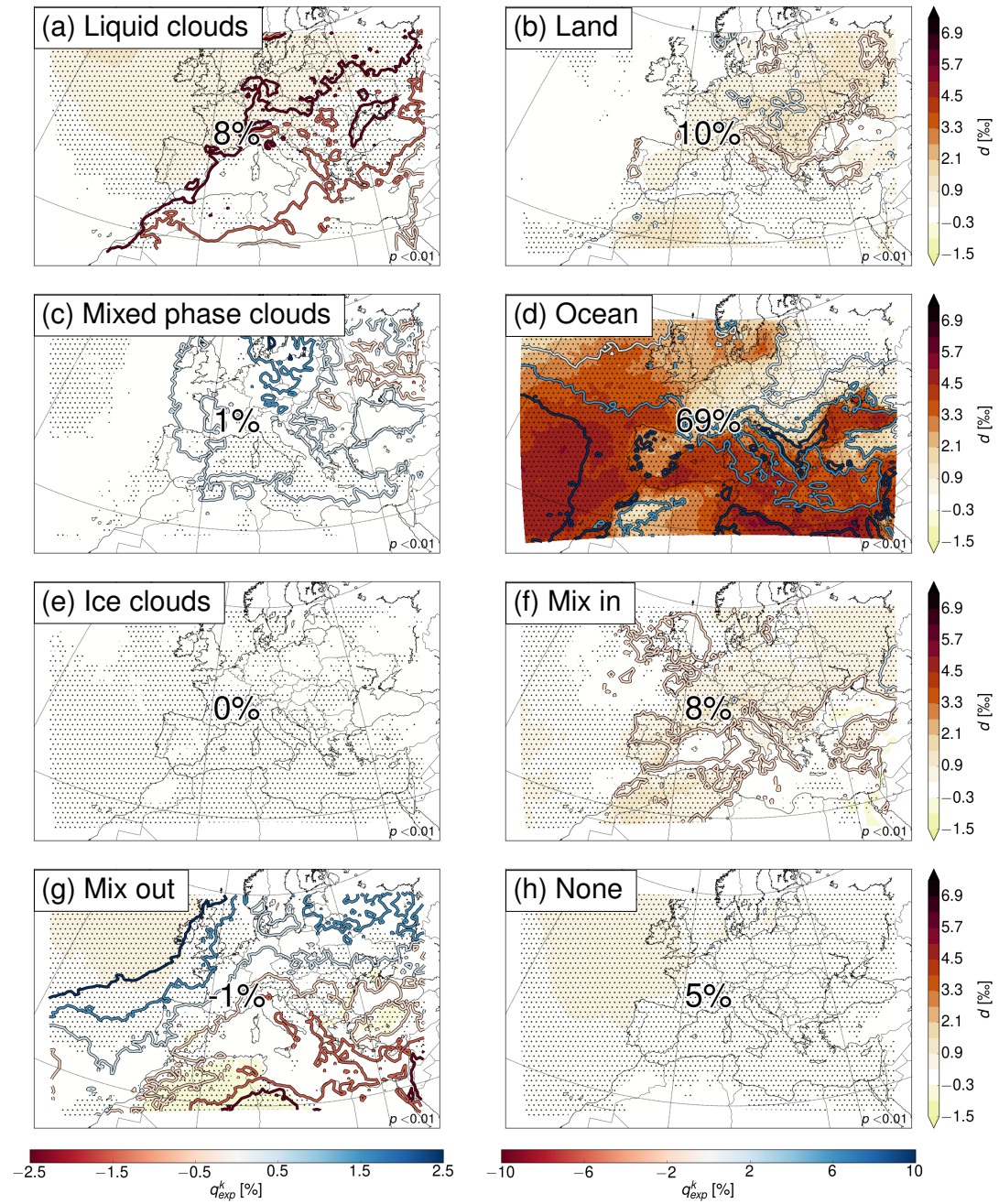
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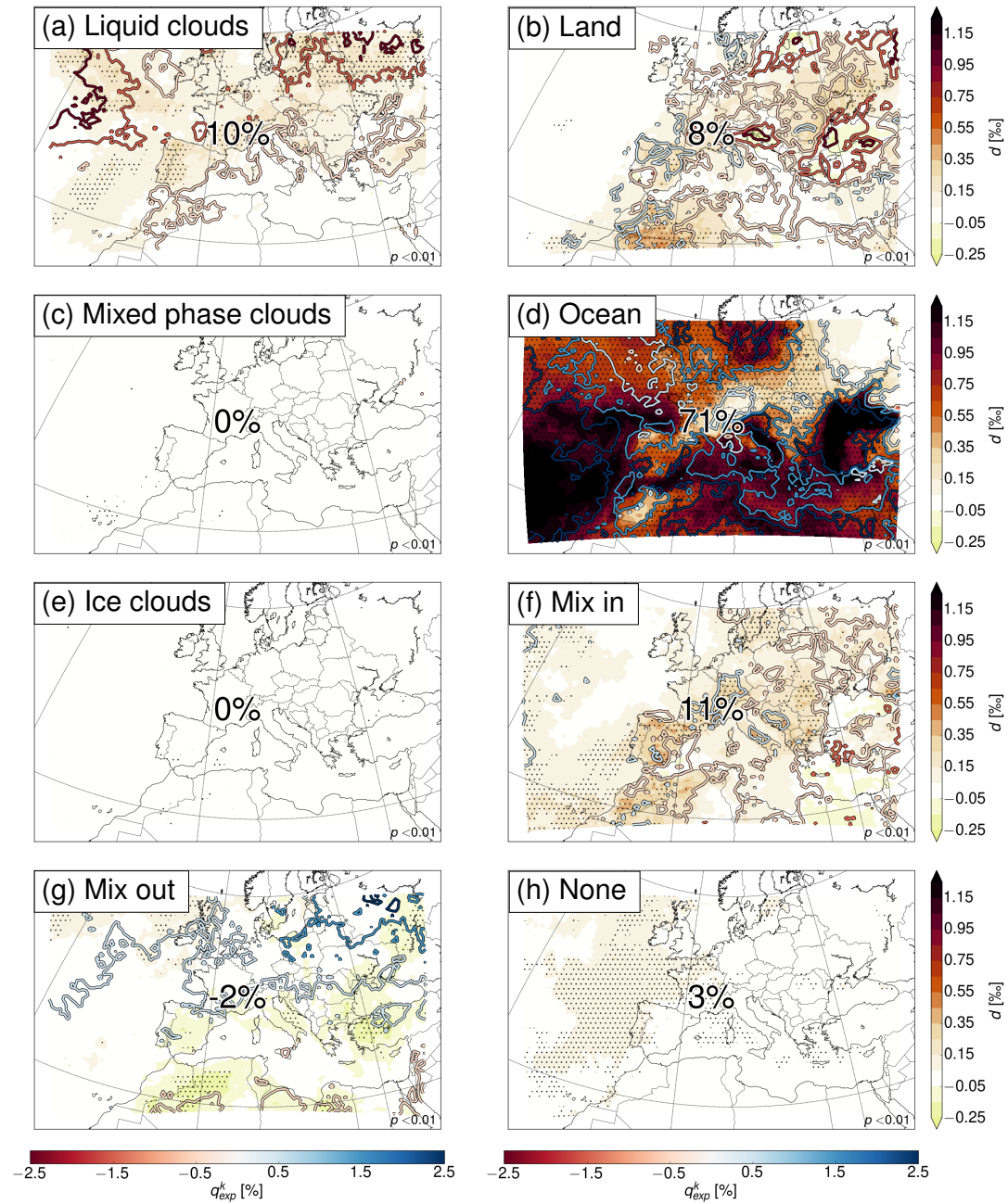
**Figure S1:** Contributions of the processes to the monthly  $\Delta\delta^2\text{H}$  in Figure 10c. The contours show the difference in  $q_{exp}^k$  (see Equations 9 and 10) between the high and low anomaly months in %. Stippling indicates areas where  $p < 0.01$ . Note the different colour scales for  $q_{exp}^k$  between the left and right hand side.



**Figure S2:** Contributions of the processes to the yearly  $\Delta\delta^2\text{H}$  in Figure 10 c. The contours show the difference in  $q_{exp}^k$  (see Equations 9 and 10) between the high and low anomaly years in %. Stippling indicates areas where  $p < 0.01$ .



**Figure S3:** Contributions of the processes to the monthly  $\Delta d$  in Figure 12c. The contours show the difference in  $q_{exp}^k$  (see Equations 9 and 10) between the high and low anomaly months in %. Stippling indicates areas where  $p < 0.01$ . Note the different colour scales for  $q_{exp}^k$  between the left and right hand side.



**Figure S4:** Contributions of the processes to the yearly  $\Delta d$  in Figure 12c. The contours show the difference in  $q_{exp}^k$  (see Equations 9 and 10) between the high and low anomaly years in %. Stippling indicates areas where  $p < 0.01$ .