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Disentangling atmosphere-ocean feedbacks during a strong wind jet event

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Due to the twofold face of the Adriatic Sea as a shallow coastal sea and as a dense water formation site, the interplay between Bora (a north-easterly wind blowing from the Dinaric alps toward the Italian Adriatic coast, eastern Mediterranean basin) jets and the sea is crucial in conditioning ocean dynamics from the scale of the very coastal processes up to the deep water circulation at the basin scale. In this work we analyse the metocean dynamics associated with Bora jets in the northern Adriatic Sea and in the surrounding coastal regions, with reference to a cold spell event that hit the eastern Europe in January 2017 bringing significant snow falls also in southern Italy and Greece. To this aim, the observational information from in-situ and remote sensing measurements is complemented by a set of numerical model runs carried out within the COAWST system in which different coupling configurations among atmosphere (WRF), ocean (ROMS) and surface waves (SWAN) models are explored, aiming at assessing the potential and the upcoming challenges for model coupling with reference to these events. Preliminary results describe the impact of the explicit description of atmosphere-ocean interactions, and of the waves modulating interface processes, in terms of ocean dynamics (especially concerning evidence from surface quantities), snowfall, and small-scale wind field features. In particular, attention is dedicated to the implications of model coupling with respect to the description of the sharp gradients characterising the coastal zones, where shortcomings in satellite products and numerical models most usually arise. This study was funded by the UE H2020 programme under grant agreement No. 730030 (CEASELESS Project, Coordinator Agustin Sanchez-Arcilla).