

## **Vertical grid-refinement for stratocumulus clouds in ECHAM-HAM**

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In global climate models (GCMs), the cloud cover of marine stratocumulus clouds is commonly underestimated. The coarse vertical resolution of GCMs does not allow to resolve important aspects of cloud-topped marine boundary layers well, like sharp temperature inversions, cloud top cooling or entrainment. To alleviate this problem in a numerical safe approach, a vertical-grid refinement is applied only in the radiation scheme of the ECHAM-HAM GCM. To this end the inversion height is reconstructed based on Grenier and Bretherton (2001) and used to redefine model levels and hence the vertical extent of stratocumulus clouds. Global simulations show that this makes the cloud cover and the thickness of stratocumulus clouds used in the radiation scheme more realistic. However, the method cannot be applied to its full potential since there is a frequent mismatch between the model level of the inversion and the cloud top.