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Simulation of the Denmark Strait overflow: does resolution matter in partial step z-coordinate numerical model?

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Dense waters determine the deep stratification of the world oceans and feed the deep boundary currents which influence the global meridional overturning circulation and climate. The circulation of dense water masses is strongly constrained by topographic slopes or sills between basins. However, the local processes that control the formation of the bottom waters, i.e. the overflow at sills and shelf breaks are still poorly resolved in present ocean general circulation models (OGCMs), partly because of a lack of vertical resolution at deep levels and because of a poor parameterisation of entrainment. This paper investigates the resolution issue as it shall discuss how the overflows of the Denmark Strait are represented in a realistic setting of the NEMO OGCM of the North Atlantic at kilometre $(1/60^\circ)$ resolution and 300 vertical levels.