



Dependence of tracer injection on the horizontal resolution in thermally driven circulations

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Through an idealized modeling study with a depth level coordinate general ocean circulation model (GFDL/MOM), the sensitivity of tracer injection into the oceans on the horizontal resolution in thermally driven circulations is investigated. As the resolution becomes higher, convective mixing in high latitudes becomes weaker, and both the strength of the overturning and the concentration of the tracer, which is injected from the surface into the ocean interior, weaken. The rate of decrease is greater with the tracer. When the resolution was increased from two degrees to quarter degree, the tracer concentration was decreased by 50 %, but the overturning weakens only by 20 % or so. This suggests that in a coarse resolution model, even though the overall overturning is reasonable, tracer injection could be overestimated due to excessive convective mixing in high latitudes.