

# Small sinking particles drive carbon export in subtropical ocean

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Using a natural screen separation, whereby naturally sinking particles pass through 335 and 50  $\mu\text{m}$ , screens, our results show that small ( $<50 \mu\text{m}$ ) sinking particles are responsible for an important fraction of sinking particles in terms of mass (37-60 %), carbon (35-59%) and nitrogen (41-59%) contents in subtropical Ocean, including East China Sea, South China Sea and the western North Pacific Ocean. Our new results suggest that the contribution of small sinking particles smaller than  $50\mu\text{m}$  to the sinking carbon flux can be a major fraction of the total sinking flux of carbon. Additionally, photos of bulk sinking particles indeed contain degraded phytoplankton cells, fecal pellets, detritus and aggregates. The dimensions of many sinking particles are less than  $50 \mu\text{m}$  and some of particles are even less than  $10 \mu\text{m}$ . Our observed results are different from previous assumption of large particles forming the majority of sinking particles in the ocean.