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(travel support requested for Jong-Mi Lee)

US GEOTRACES Pacific Meridional transect: the geochemistry of size-fractionated suspended particles collected by in-situ filtration—the role of particles in TEI cycling in the Pacific Ocean

We plan to submit a proposal to the Feb 15, 2017 NSF OCE panel to determine geochemical composition in size-fractionated (<51µm, >51µm) suspended particles collected by in-situ filtration. We are interested in how particle distribution varies with depth in different environmental conditions, such as nutrients, productivity, and dust inputs, and how that affects the efficiency of biological pump and the internal cycling of particulate TEIs, especially scavenging. Motivations include higher opal concentrations and high reactive particulate iron from glacial sources at the Alaskan end of the transect, both of which may have interesting effects on the scavenging of TEIs. Recent synthesis activities also highlighted the importance of particle size distribution for internal cycling—both for biological uptake rates, and for scavenging. Because we are limited to only two size fractions for particle geochemistry, we hope to work with investigators interested in using optical techniques of particle characterization (transmissometry, LISST, UVP).

- 1) Research goals and relevance to the overall objectives of the section: to determine the **major particle phases** (POC, CaCO₃, opal, lithogenics, oxyhydroxides), chemical dry weight (**suspended particulate mass**), and **total concentrations** of key (Fe, Al, Zn, Mn, Cd, Cu) and other trace and interesting elements (Co, Ni, Ti, Ba, P) in size-fractionated particles across the section
- 2) Sample requirements: We will require subsamples from the Supor filters for biogenic silica and particulate trace metals (including lithogenic material), from the QMA filters for POC and PIC, and from the >51µm prefilters for all components.
- 3) Division of labour: Phoebe Lam will analyze major particle phases, and Jong-Mi Lee will analyze particulate TEIs.
- 4) Berth requirements: Pump deployment and particle subsampling are part of the management proposal for this section. We request 0-1 berths from this proposal to help with general on-board processing of particles and overall pump activities on board.