Statement of Interest for Alaska-Tahiti section:
Trace elements in suspended particles: high spatial resolution sampling of key features along the Pacific Meridional Section.

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Specific research goals and relevance to the overall objectives of the section:

A) Determine **total suspended particulate trace element concentrations** for every station and every depth on the section in order to quantify the role of particles interacting with dissolved trace elements through varying oceanic regimes. Sampling particles from GO-Flo bottles allows direct comparison with dissolved samples from the same bottles and provides sampling resolution for resolving key features on this section: four likely **hydrothermal** sources, N. Pacific **HNLC**, low productivity **gyre**, and equatorial **upwelling** systems, strong N. Pacific **oxygen minimum** zones in the thermocline, and **nepheloid** layer variations.

B) Apply **complete digestion, weak acid leach, and ICP-MS** to determine >35 elements (as per the last two US GEOTRACES cruises), including key/essential Geotraces trace elements (Fe, Al, Zn, Mn, Cd, Cu, Co) as well as other elements of interest (REEs, P, Ca, Sr, Ni, Ti, ^{232}Th, Y, Ba, V, Mo, Ag, Pb, Be, As, and U).

C) **Collect surface sediment and "fluff" layer samples** using a mini gravity corer as on EPZT. Same analytical methods as for GO-Flo particles.

D) Interpret **transmissometer, optical backscatter and possibly LISST data**; expand calibration of optical signals against particulate phase concentrations.

I will also be advocating for a discussion of the potential for three new approaches to dissolved-particulate exchange:

1. High depth- and lateral-resolution sampling of the EqPac system. I plan to show preliminary surface dissolved metals data from the TOGA-TAO array in support of this effort. The rate of nitrate drawdown poleward of the equator is not well understood.
2. Isotope tracer experiments to explore the rate of dissolved-particulate metal exchange in various ocean regimes along the section.
3. Drifting or neutrally buoyant short-term traps deployed during Superstations to complement modeling or Th-based approaches to establishing rates of TEI regeneration.