What can we learn from observations of small dust grains in the interstellar space?

Andrzej Czechowski\textsuperscript{1} and Ingrid Mann\textsuperscript{2}

\textsuperscript{1}Space Research Center, Polish Academy of Sciences, Bartycka 18A, 00-716 Warsaw, Poland (ace@cbk.waw.pl)
\textsuperscript{2}Department of Physics and Technology, UiT the Arctic University of Norway, Posboks 6050 Langnes, 9037 Tromso, Norway

A fraction of the dust that is contained in the local interstellar medium around the Sun can enter the heliosphere and be observed in the solar system. The exception is the small size component of the interstellar dust spectrum, which can be directly observed only beyond the heliopause.

The charge-to-mass ratio of the interstellar dust grains of nanometer size can be high enough to make their dynamics highly sensitive to the magnetic field and plasma flow. Based on numerical simulations and analytical models, we show how the small interstellar grains entering the transition region between the undisturbed interstellar medium and the outer boundary of the heliosphere respond to plasma and magnetic field structures (in particular the heliospheric bow shock and the heliopause) expected in this region. We also point out which dust impact measurements from a spacecraft in the interstellar space would be most desirable for imaging the structure of the transition region by means of interstellar dust.