OBJECTIVES

We proposed to focus on developing of a ‘piercing blade’ type sampling system for capturing at least 500 cc cometary material from depth of at least 10 cm. The focus was on 2, 3, and 4 blade geometries: BiBlade (JPL), Tetrahedral Comet Sampler (TeCoS) and Pyramid Comet Sampler (PyCoS). The sampler is required for the NASA New Frontiers Comet Surface Sampler Return mission.

NOTE:
TRL IN: 2
TRL OUT: 3
(the system is not picking up TRL IN value for some reason, hence this note, per COR’s instructions)

ACCOMPLISHMENTS

KEY MILESTONES MET

The work in Phase I focused on acquiring fundamental data related to penetrating of analog comet materials with blades of various geometries. Two experimental setups were developed
Several prototype blades were developed
A large number of experiments were performed
Data has been analyzed and architectures for comet sampling system proposed

FUTURE PLANNED DEVELOPMENTS

PLANNED POST-PHASE II PARTNERS
NASA JPL
Chemring Energetic Devices

PLANNED/POSSIBLE MISSION INFUSION
NASA New Frontiers (NF4) Comet Surface Sample Return (CSSR) Mission
NASA Cryogenic Comet Nucleus Sample Return (CCSNR) Mission
NASA Asteroid Redirect Mission

PLANNED/POSSIBLE COMMERCIALIZATION
NASA
Planetary Resources
Deep Space Industries

CONTRACT (CENTER)  NNX14CP33P (JPL)  SOLICITATION-PHASE  SBIR 2014-I

SUBTOPIC  S4.02 Robotic Mobility, Manipulation and Sampling  TA  4.3.7 Robotic drilling mechanisms

TRL  1  2  3  4  5  6  7  8  9  OUT