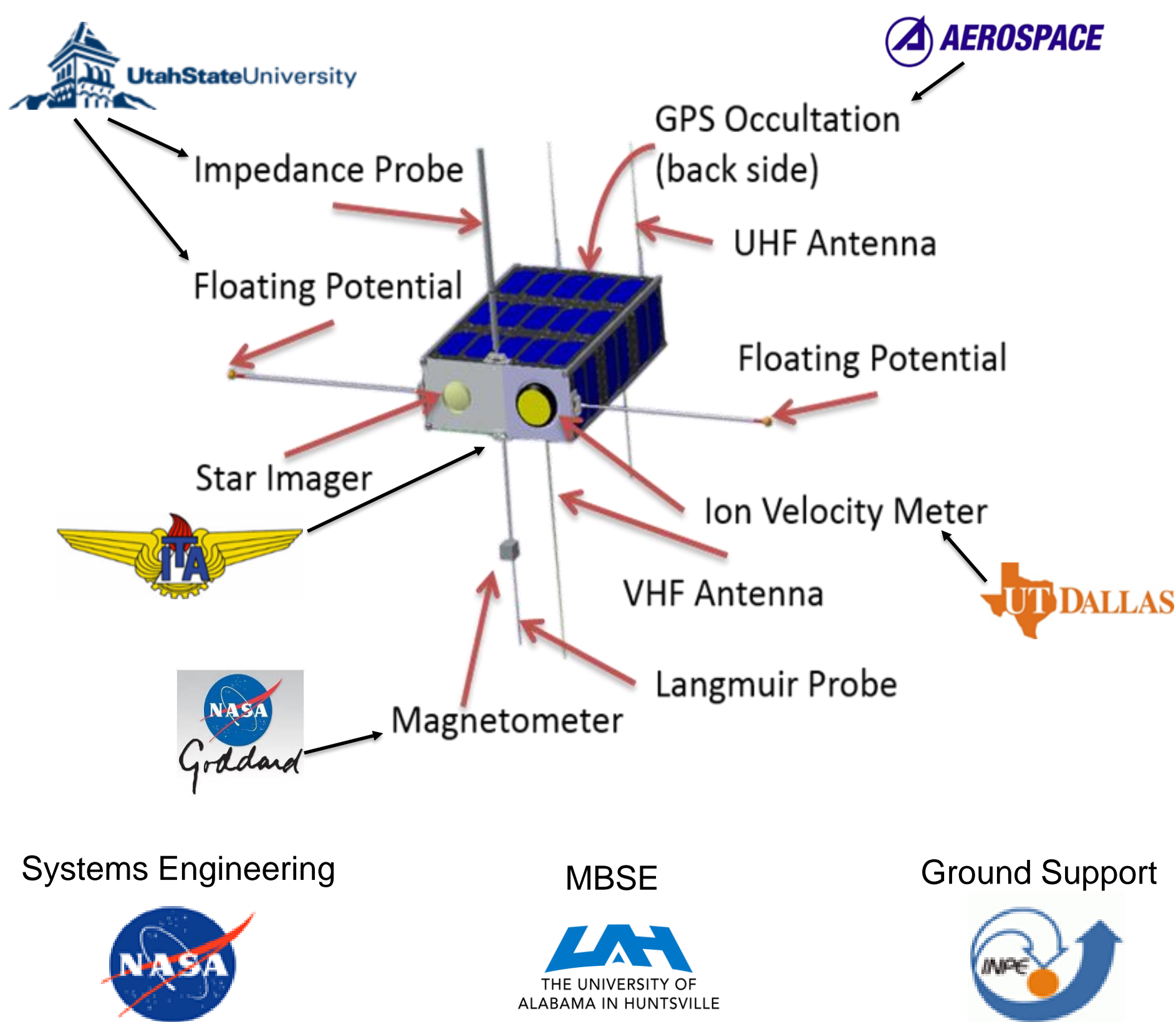


# Implications of using a new Systems Engineering Approach in a Multi-Team International Project

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## Overview/Introduction

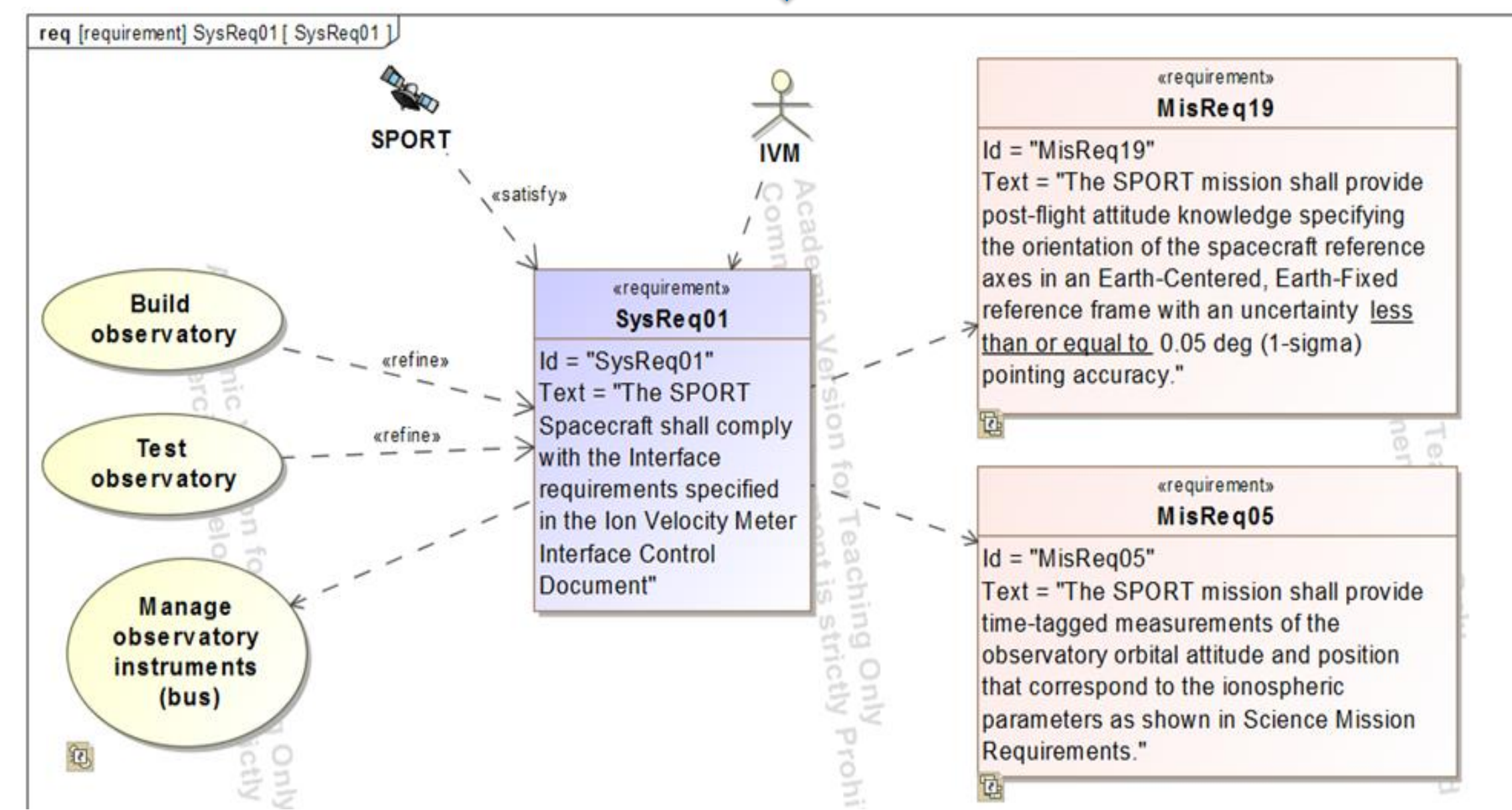
The aim of this study is to identify the advantages of introducing a model-based systems engineering (MBSE) approach in a multi-team international project. The project is a 6U CubeSat called SPORT that is being jointly developed by the United States and Brazil to study ionospheric plasma bubbles that hamper satellite communication.



## Comparison of Approaches

Req #	Text	Traceability	Functions
SysReq01	The SPORT Spacecraft shall comply with the interface requirements specified into Ion Velocity Meter instrument Interface Control Document	MisReq05 MisReq19 SysReqX05 SysReqX07	Build Observatory Test Observatory Manage Instruments
SysReq02	The SPORT Spacecraft shall comply with the interface requirements specified into GPS Radio Occultation Interface Control Document	MisReq05 SysReqX07	Build Observatory Test Observatory Manage Instruments
SysReq03	The SPORT Spacecraft shall comply with the interface requirements specified into Science Magnetometer Interface Control Document	MisReq05 SysReqX07	Build Observatory Test Observatory Manage Instruments

### Traditional Documents-Focused Approach



### Model-Based Approach

## Introduction of New Approach

The University of Alabama in Huntsville team was assigned the task of creating an integrated systems model for the SPORT project in SysML. The primary reason behind this was to create a database for requirements that enabled improved traceability between requirements. A simulation of the satellite states in orbit will also be created using state machine diagrams to improve the probability of success of the high-risk mission.

## Key Findings

- Acceptance of using MBSE over the traditional documents-focused approach was met with hesitation
- Payload subsystem teams were more focused on ensuring their own requirements were correct and represented, than developing a system representation
- Systems engineering teams were willing and eager to adopt MBSE and contribute to improve the system model
- External reviewer suggested that the SysML model be the primary requirements repository for the project

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