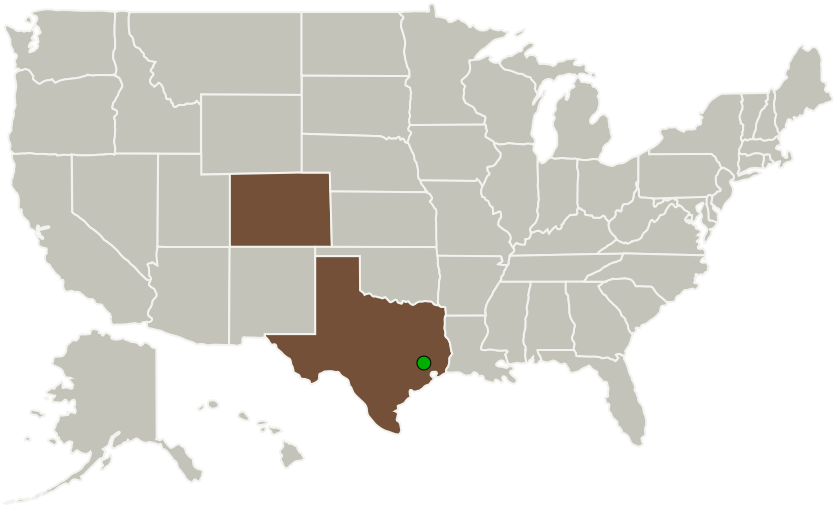
RSim: A Simulation Tool Integrating Radiation Codes and CAD., Phase I

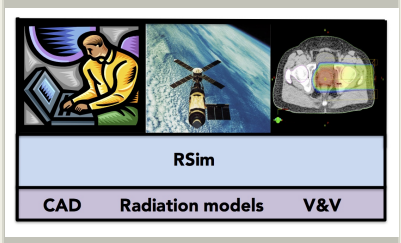
Completed Technology Project (2017 - 2017)

Project Introduction

It is important to NASA engineers to be able to model radiation effects through very complex vehicle structures. This requires (1) integration of modeling tools with Computer Aided Design (CAD); (2) easy and uniform setup of materials, particles sources and tallies; (3) ability to analyze and validate the results across multiple radiation codes. Tech-X will deliver RSim, a across-platform standalone application for radiation modeling. RSim will have a Graphical User Interface that will allow users to perform setup, run and do post-processing for several radiation modeling tools. The setup will include Constructive Solid Geometry creation and CAD import, materials annotation, particles sources setup and choosing tallies. RSim will be able to run several radiation codes to facilitate Validation and Verification. Post-processing in RSim will allow for 3D visualization, 2D plots and histograms. Phase I will concentrate on CAD import and material annotation for MCNP6 and PHITS codes and develop RSim prototype. In Phase II we will fully implement RSim and consider integrating with more codes, for example Geant4.

Primary U.S. Work Locations and Key Partners





RSim: A Simulation Tool Integrating Radiation Codes and CAD., Phase I Briefing Chart Image

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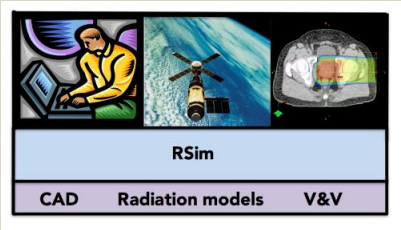
Organizations Performing Work	Role	Type	Location
Tech-X Corporation	Lead Organization	Industry	Boulder, Colorado
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Colorado	Texas

Images



Briefing Chart Image
RSim: A Simulation Tool Integrating Radiation Codes and CAD., Phase I Briefing Chart Image *(https://techport.nasa.gov/image/137076)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Tech-X Corporation

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

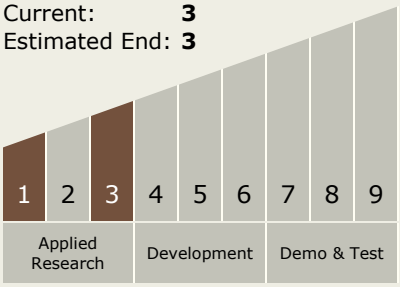
Carlos Torrez

Principal Investigator:

Svetlana Shasharina

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  └ TX06.5 Radiation
    └ TX06.5.4 Space Weather Prediction