Fiscal Year:	FY 2012	Task Last Updated:	FY 02/09/2012
PI Name:	Newman, Dava J. Ph.D.		
Project Title:	Spacesuit Trauma Countermeasure System f	or Intravehicular and Extravehicular	Activities
Division Name:	Human Research		
Program/Discipline:	HUMAN RESEARCH		
Program/Discipline Element/Subdiscipline:	HUMAN RESEARCHBiomedical countermeasures		
Joint Agency Name:		TechPort:	Yes
Human Research Program Elements:	(1) HHC :Human Health Countermeasures		
Human Research Program Risks:	(1) EVA:Risk of Injury and Compromised P	erformance Due to EVA Operations	
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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Zip Code:	02139-4301	Congressional District:	8
Comments:			
Project Type:	GROUND	Solicitation / Funding Source:	2010 Crew Health NNJ10ZSA003N
Start Date:	11/30/2011	End Date:	11/29/2014
No. of Post Docs:		No. of PhD Degrees:	
No. of PhD Candidates:		No. of Master' Degrees:	
No. of Master's Candidates:		No. of Bachelor's Degrees:	
No. of Bachelor's Candidates:		Monitoring Center:	NASA JSC
Contact Monitor:	Baumann, David	Contact Phone:	
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Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):	Hoffman, Jeffrey (Massachusetts Institute	of Technology)	
Grant/Contract No.:	NNX12AC09G		
Performance Goal No.:			
Performance Goal Text:			
	A significant number of astronauts sustain in mechanisms responsible for astronaut suit in Trauma Countermeasure System will increas training, operations and during IVA launch/I EVA physiology research. The research obje investigating suit-human biomechanical inte protection concepts; and developing a protot used as a testbed. Leveraging our previous work, we will initia protection design concepts. Our methods inc better understand visualize and quartify the	juries during extravehicular activity juries and propose novel technology se crew comfort and decrease the ris anding impacts. The proposed work ectives include: investigating astrona ractions that affect crew injury; prov ype suit trauma countermeasure gar illy model astronaut EVA and IVA so lude combining musculoskeletal phy- injuries resulting from suit human	(EVA). We will investigate the solutions. The proposed Spacesuit k of injury during astronaut EVA supports ongoing advanced astronaut ut EVA musculoskeletal injuries; viding suit injury prevention and comfort ment, which will be demonstrated and suit injury and propose novel comfort ysiology and physics-based models to nteractions. There is a need to further

Task Description:	assess EVA training operations (i.e., neutral buoyancy laboratory (NBL)) to completely understand injury potential and viable prevention and protective solutions. Various comfort/protection garment concepts will be analyzed, followed by requirements and materials specification. Finally, a suit countermeasure prototype garment will be fabricated and demonstrated as the culmination of this research effort.
	We envision a Spacesuit Trauma Countermeasure System that will 1) protect astronauts against launch or entry impact injury and 2) prevent EVA injury by accounting for the large extraneous suit volume and reducing rubbing and pressure point injuries between the human and hard suit elements. The significance of this research effort contributes to the NASA goal to provide human health and performance countermeasures, knowledge and technologies for space exploration and explicitly develops a technological countermeasure garment to mitigate the risk of compromised EVA crew health performance due to inadequate EVA suit systems.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	New project for FY2012.
Bibliography Type:	Description: (Last Updated: 03/20/2019)