Fiscal Year:	FY 2012	Task Last Updated:	FY 02/27/2012
PI Name:	Mollicone, Daniel Ph.D.	-	
Project Title:	Individualized Stress Detection System		
Division Name:	Human Research		
Program/Discipline:	HUMAN RESEARCH		
Program/Discipline Element/Subdiscipline:	HUMAN RESEARCHBehavior and performance		
Joint Agency Name:		TechPort:	No
Human Research Program Elements:	(1) BHP :Behavioral Health & Performance (archival in 2	2017)	
Human Research Program Risks:	(1) Sleep :Risk of Performance Decrements and Adverse Desynchronization, and Work Overload	Health Outcomes Resulting from	Sleep Loss, Circadian
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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Zip Code:	19104	Congressional District:	2
Comments:			
Project Type:	GROUND	Solicitation / Funding Source:	SBIR Phase II
Start Date:	01/31/2012	End Date:	05/29/2015
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:	Leveton, Lauren	Contact Phone:	
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Flight Program:			
Flight Assignment:	NOTE: End date change (original end date was 1/31/201 (Ed., 9/4/14)	4) per HRP Technology Pipeline	information, per B. Corbin
Key Personnel Changes/Previous PI:			
COI Name (Institution):			
Grant/Contract No.:	NNX12CA61C		
Performance Goal No.:			
Performance Goal Text:			

Task Description:	Given the extended duration of future missions and the isolated, extreme, and confined environments, there is the possibility that stress-related behavioral conditions and mental disorders (DSM-IV-TR) will develop. The overarching goal of this project is to deliver an integrated system that will track physiological signals (heart rate and heart rate variability) and behavioral signals (sleep wake patterns) to detect chronic stress, hyperarousal, and insomnia during space missions. This project will deliver both the sensor hardware and signal processing software needed for the real-time data collection and integration with other behavioral health monitoring systems (e.g., Individualized Fatigue Meter and Individualized Behavioral Health Meter). The result of Phase II will be a system that can be deployed in space analog environments for validation testing and ultimately deployed on ISS to assist astronauts and mission support personnel in the detection of astronaut chronic stress, hyperarousal, and insomnia. The critical need for an Individualized Stress Detection System has been identified as a priority outlined in the BHP IRP Gap BMED2. The Technology Readiness Level at the end of Phase II will be TRL 5. POTENTIAL NASA COMMERCIAL APPLICATIONS: The Individualized Stress Detection System will meet the specific requirements of long duration exploration missions and provide feedback to astronauts, Op Psy personnel and flight surgeons about stress levels and hyperarousal as well as aid in the selection of countermeasures. It will be designed to be unobtrusive and to require minimal training and crew effort to utilize. The resulting product will be primarily relevant to NASA's Behavioral Health and Performance (BHP) research gap BMED 2: "What are the most effective methods to predict, detect, and assess decrements in behavioral health (which may negatively affect performance) before, during, and after spaceflight missions?" The resulting product will also be relevant to gaps BMED1, BMED6, and BMED7. When validated,	
Rationale for HRP Directed Research:		
Research Impact/Earth Benefits:	The Individualized Stress Detection System can be adapted to meet an articulated need to track chronic stress and hyperarousal in occupations associated with high workload and high danger factor such as military operations and law enforcement. A tool that enables the systematic and efficient tracking of sympathetic activation in these occupational settings can provide a means to detect and address stress-related behavioral disorders and mental conditions at an early stage. Taking military operations as an example, there is evidence that stress-related behavioral disorders and mental conditions such as anxiety, depression, and post-traumatic stress disorder have a high prevalence among soldiers. There is a present market opportunity to deliver an Individualized Stress Detection System to track changes in objectively-measured markers of chronic stress levels in soldiers during training, deployment, and post-deployment.	
Task Progress:	New project for FY2012. Reporting not required for this SBIR Phase 2 project.	
Bibliography Type:	Description: (Last Updated: 02/23/2015)	