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Wearable Radio Frequency Weapon Exposure Detector

Award Information

Agency:

Department of Defense

Branch:

Defense Health Agency

Contract:

W81XWH22C0086

Agency Tracking Number:

H2-0676

Amount:

\$1,085,233.00

Phase:

Phase II

Program:

SBIR

Solicitation Topic Code:

DHA211-005

Solicitation Number:

21.1

Timeline

Solicitation Year:

2021

Award Year:

2022

Award Start Date (Proposal Award Date):

2022-07-28

Award End Date (Contract End Date):

2024-12-04

Small Business Information

ENGENIUSMICRO LLC ([/web/20240617131752/https://www.sbir.gov/sbc/engeniushmicro-llc](https://web/20240617131752/https://www.sbir.gov/sbc/engeniushmicro-llc))

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Huntsville, AL 35801-4605

United States

DUNS:

796514763

HUBZone Owned:

Yes

Woman Owned:

No

Socially and Economically Disadvantaged:

No

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Research Institution

N/A

Abstract

RF weapons are an emerging battlefield threat. These directed energy weapons are being demonstrated at higher power levels and in smaller, less costly, and more mobile platforms. However, while the defense industry is just now beginning to understand the effects of high-levels of RF energy on electronic systems, through rigorous test and evaluation of instrumented targets and systems, there is significantly less data and understanding of the effects on biological systems. As has been done in the case of instrumented targets to evaluate the effects of RF on electronics, there must be a system and methodology for instrumenting personnel to capture the levels of RF energy received and correlate that to injury, changes in perception, and other issues that would represent threats to the warfighter. In Phase I, EngeniusMicro evaluated the development of a low cost, low weight, small size wearable radio frequency (RF) weapon exposure dosimeter based on recent developments in broadband RF power detectors. Also, during the Phase I, EngeniusMicro evaluated the design space for a suitable dosimeter and performed proof-of-principle demonstrations of critical technologies through simulation and lab testing. In this proposed Phase II SBIR, EngeniusMicro will prototype and test the dosimeter. This prototype will consist of a broadband RF metamaterial absorber, with minimal electronic components to rectify the RF energy absorbed and display it on a small, persistent, electrochromic display. This display will serve as an easy-to-read indicator on the device when it is placed in a MOLLE type magazine pouch. Prototype development will include device refinement through judicious component selection, artful industrial design considerations, state-of-the-art metamaterial design, and robust shielding of the electronics. Consideration of RF bioeffects and on-body device performance will inform EngeniusMicro's development decisions. Data from RF dosimetric FDTD simulations will be incorporated into the design considerations, along with the results from high powered microwave testing with a torso phantom.

* Information listed above is at the time of submission. *

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