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ELECTRICAL MUSCLE STIMULATION EXOSKELETON SUIT TO MITIGATE
MUSCULOSKELETAL ATROPHY FOR AEROSPACE MISSIONS AND REHABILITATION
THERAPY.**Abstract**

Astronauts experience muscle atrophy and loss of density in their musculoskeletal system due to the prolonged exposure of low gravity environments. One solution to mitigate such problems is applying electrostimulation to the muscle groups that are prone to experience atrophy. The combinational use of bionics and integrated circuitry can facilitate the creation of Electrical Muscle Stimulation Exoskeleton Suit (EMSES), to enable muscle groups to react to working conditions similar to that of Earth's gravitational field at its surface level. The EMSES would act as a variable support for the astronaut, its electronics housing, and its electrodes. Electrostimulation would be achieved by integrating a circuit capable of controlling the amplitude and frequency of a low intensity, monopolar rectangular pulsed signal. In addition to normalizing prolonged exposure to low gravity environments, EMSES could also be applied to aid in various therapeutics. Specifically, physiotherapy, which includes multiple population sectors and benefits patients who suffer from physical disabilities, such as paralysis, that restrict the motion and movement of the human body.