

ACME

Another Charge Management Electronics

An effective way to neutralise the net electric charge in isolated test masses in highly sensitive space-based gravitational experiments is to use the photoelectric effect generated by an ultraviolet light source. Mercury lamps have been successfully used in LISA Pathfinder. For the gravitational-wave observatory LISA it is foreseen the use of UV light-emitting diodes (UV LED). They offer numerous advantages over heritage discharge lamps, like the ability to produce either continuous or pulsed light, substantial reduction of mass, volume and power consumption and long term stability. In this contribution we present a charge management drive unit based on an FPGA, field programmable gate array that can pilot a current driven UV-LED in both pulsed and dc mode. In the pulsed mode, the ACME drive unit can deliver sub μs pulses of chosen duration, delay (wrt a trigger signal) decimation and power. We also report the result of the test campaign that was performed to qualify our electronics and to characterize the available UV-LED emitting in the useful 240-255 nm range. The results include the evaluation of the photon numbers released by the UV-LEDs with a single current pulse as well as their spectral response.