

## NASA SGSLR Power and Lightning Protection

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**Abstract:** The Space Geodesy Satellite Laser Ranging (SGSLR) Lightning Protection System will use a multi-tiered system to protect the system's sensitive electronic equipment and instrumentation. Without such protection, a ranging system can incur extensive electronic equipment damage and/or lengthy operational interruptions. As an example, on June 14, 2015, severe lightning occurred in the Goddard Space Flight Center (GSFC) location of the SGSLR Prototype, the NGSLR. When attempting to power on the various equipment of the NGSLR the following workday, it was realized that the system suffered significant damage to almost all of the major subsystems: meteorological, communications, timing, aircraft avoidance, optical bench, computer, security, and Heating Ventilation Air Conditioning (HVAC) equipment all received severe damage. Even the adjacent Mobile Laser Ranging System (MOBLAS) 7 station system incurred damage because of common signal paths between the systems. Another example of severe lightning damage occurred this year at the McDonald Laser Ranging System (MLRS) in Fort Davis, Texas, US. As a result of these incidents, a multi-tiered lightning protection system was designed and has been implemented for the GSFC Goddard Geophysical and Astronomical Observatory (GGAO) SGSLR and will be installed at all of the SGSLR sites. System power, station grounding, and data and communications have all been addressed to greatly minimize the effects of a lightning strike and/or associated power surges. This poster describes the resulting new lightning protection system as it is being installed at the SGSLR at the Goddard Geophysical and Astronomical Observatory (GGAO).

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