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Abstract for an Invited Paper for the SES11 Meeting of the American Physical Society

Monitoring electrical and thermal burns with Spatial Frequency Domain Imaging JESSICA RAMELLA-ROMAN, The Catholic University of America

Thermal and electrical injuries are devastating and hard-to-treat clinical lesions. The pathophysiology of these injuries is not fully understood to this day. Further elucidating the natural history of this form of tissue injury could be helpful in offering stage-appropriate therapy. Spatial Frequency Domain Imaging (SFDI) is a novel non-invasive technique that can be used to determine optical properties of biological media. We have developed an experimental apparatus based on SFDI aimed at monitoring parameters of clinical interest such as tissue oxygen saturation, methemoglobin volume fraction, and hemoglobin volume fraction. Co- registered Laser Doppler images of the lesions are also acquired to assess tissue perfusion. Results of experiments conducted on a rat model and discussions on the systemic changes in tissue optical properties before and after injury will be presented.