Contribution ID: **105** Type: **Poster**

Tracking system at the DarkSHINE experiment

The DarkSHINE experiment proposes a novel approach to single-electron-on-fixed-target exploration, focusing on the search for dark photons through its invisible decay to dark matter particles. Central to its design is the tracker detector, engineered to deliver exceptional sensitivity in detecting light dark matter candidates. Leveraging advancements in detector technology, particularly the emergence of AC-coupled Low Gain Avalanche Diode (AC-LGAD), this paper investigates the performance of several prototype AC-LGAD strip sensors tailored for the DarkSHINE tracking detector. The study evaluates the electrical characteristics of these sensors across two batches of wafers with varying n+ doses. The spatial and time resolution are also measured with infrared laser source. The measured spatial resolutions range from 6.5 μm to 8.2 μm and from 8.8 μm to 12.3 μm for AC-LGAD sensors from two different dose batches, featuring a 100 μm pitch size. Furthermore, time measurement resolutions of 8.3 ps and 11.4 ps are achieved which underscores the promising performance of AC-LGAD technology in advancing the capabilities of DarkSHINE's tracking system.

Primary authors: Prof. 刘, 坤 (李政道研究所); Mr 张, 峻华 (李政道研究所); Mr 刘, 康 (Shanghai Jiao Tong University); Prof. 梁, 志均 (中国科学院高能物理研究所); Dr 赵, 梅 (中国科学院高能物理研究所); Dr 李, 梦朝 (中国科学院高能物理研究所); Dr 王, 雨风 (李政道研究所)

Presenter: Mr 刘, 康 (Shanghai Jiao Tong University)

Session Classification: 墙报展及评选

Track Classification: 粒子物理实验技术