Contribution ID: **419** Type: **Poster presentation**

A data transmission system for the phase contrast X-ray human computed tomography prototype

Thursday 14 June 2018 15:50 (1 minute)

Theoretically, the cross section of X-ray phase shift caused by these low-Z elements is at least three orders of magnitude higher than the absorption. Thus the phase contrast X-ray imaging can offer better imaging contrast. A low-dose, large vision field and high phase contrast human CT prototype based on three-grating interferometry is in development by NSTL (national synchrotron radiation laboratory Hefei).
To achieve 200mm*200mm vision field, 43 detector boards are adopted in this prototype. Each detector board has 384 channels with 20 bit resolution. The acquisition starts once every 1.25ms, which means the total bandwidth is more than 250Mbps. Furthermore, as a spiral scanning device, the data of all detectors should be transferred form the rotator to the stator. Given all that, a data transmission system is designed to meet the data transfer requirement of this porotype.
The data transmission system proposed in this paper contains two parts: three Data Collection boards (DCB) mounted on the rotor of the slip ring and one data transmission board (DTB) on the stator. All data from the detectors are cached into the DDR3 memory chip. Two small form pluggable (SFP) modules on the DCB and DTB respectively realize the data transmission from the rotor to the stator.
The test result shows that this system can meet the requirement of data transmission for this prototype. We use this system to test the performance of 43 detectors successfully. This data transmission structure can be a guidance for similar device.

Minioral

Yes

Description

Algo

Speaker

rongqi sun

Institute

USTC

Country

China

Author: Dr SUN, rongqi (State Key Laboratory of Particle Detection and Electronics, University of Science and Technology of China)

Co-authors: LIAN, chen (State Key Laboratory of Particle Detection and Electronics, University of Science and Technology of China); Dr LU, houbing (College of Electronic Engineering of National University of Defense and Technology); Dr LI, feng (State Key Laboratory of Particle Detection and Electronics, University of Science and Technology of China); Dr LIANG, futian (State Key Laboratory of Particle Detection and Electronics, University of Science and Technology of China); JIN, Ge (Univ. of Science & Tech. of China (CN))

Presenter: Dr SUN, rongqi (State Key Laboratory of Particle Detection and Electronics, University of Science and Technology of China)

Session Classification: Poster 2

Track Classification: Data Acquisition