

## AbstractID: 11776 Title: Time Response Study of Calypso Localization and Tracking System for Moving Tumors

**Purpose:** To study the time response of the Calypso 4D localization and tracking system for prostate and pancreatic tumors

**Method and Materials:** We have implanted Calypso beacon transponders into pancreas of three patients for tumor tracking during the radiation delivery.

The system is originally designed for localization and tracking of prostate during radiotherapy. We have observed delay times for localization and delay of start time for tracking longer for pancreatic cases as compared to prostate cases. The system has successfully tracked our pancreatic patients for each treatment. To investigate the delay time as a function of tumor motion, we assembled a moving platform and placed a phantom with imbedded transponders on it. The phantom was moved sinusoidally with various frequencies. The ranges of frequencies included the motion correlated with prostate and pancreas. In the case of pancreas, there is direct correlation with the breathing cycle.

**Results:** The usual delay time for prostate localization and delay time for start of tracking is about 10 to 12 seconds. For pancreatic cases, the time of localization and tracking increases by a factor of 9 to 10. The system delay does not affect its ability to accurately track tumor motion.

**Conclusion:** The Calypso is a robust system that is capable of tracking tumors covering a wide spectrum of motion including respiratory motion. The delay time for localization and tracking modules are well accepted clinically.