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Startup of the HLS in SPEAR3

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1 Introduction

Previous HLS measurements have shown that the floor in SPEAR3 is moving by up to 100 micrometers per day. To get more information on the movement in the SPEAR3 ring a new extended HLS system was installed during the downtime.

2 Installation

Up to now we have successfully installed 17 HLS sensors in the SPEAR3 ring and along BL12, see Figure 1. All sensors are installed directly on the concrete floor. Three additional sensors (BL12 mono, BL12 M1/M2 mirror and BL11D) will be added on November 12th-13th. The main water pipe is a half filled 2 inch PVC pipe with 1 ½ inch connections to the sensors. For the penetration from the SPEAR ring to the BL12 hutch a 1 ½ inch pipe was installed. Because the penetration is lower than the rest of the water system the pipe filled fully with water. In order to achieve air pressure equilibrium on both sides of the system a separate air hose was installed. The same is the case at beam line 13.

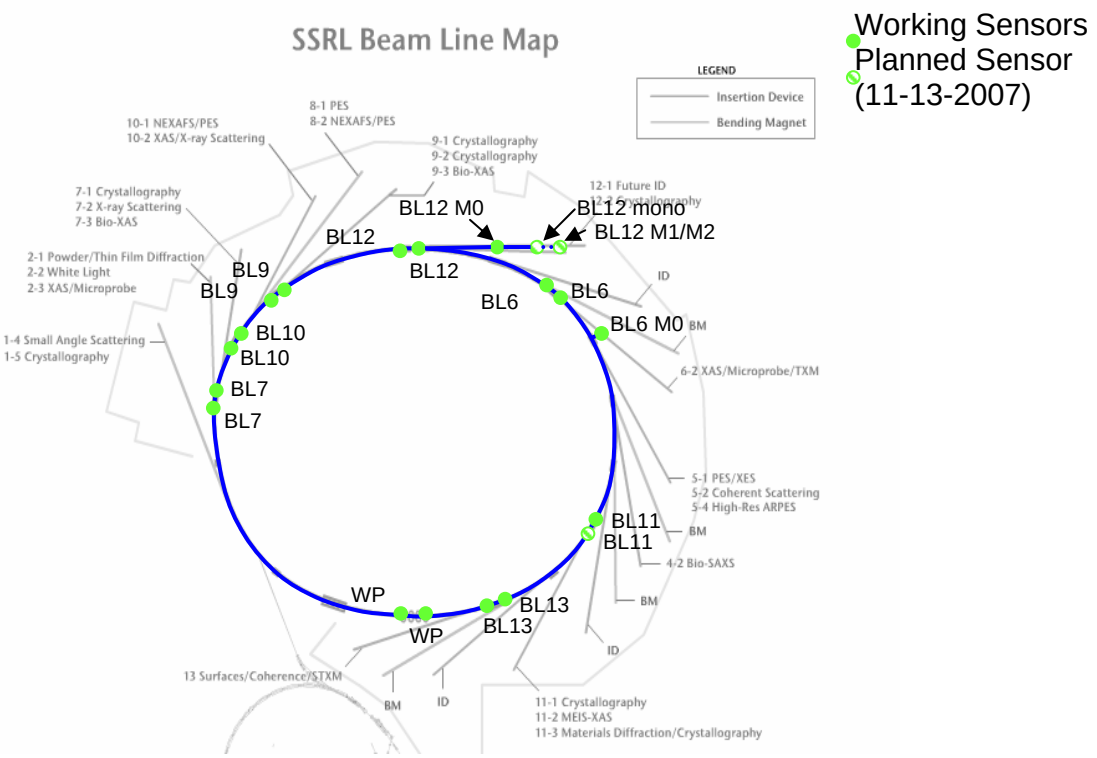

Figure 1: HLS system set up

3 First results

We have continuous data for 17 sensors which show movements of up to 30 micrometers for the last 2 days. Most of the ring seems to be stable with respect to our reference in the east pit, see Figure 2. The fog and cloud cover over the past couple of days may explain this stability since we previously saw the biggest movements on sunny days. We discontinued the monitoring of BL 4 ID where we saw the biggest movements in the past. In order to visualize the current movements better I added a new graph which shows the trend of movement over the last 4 hours with respect to our reference sensor at the BL12 ID in the east pit, see Figure 3.

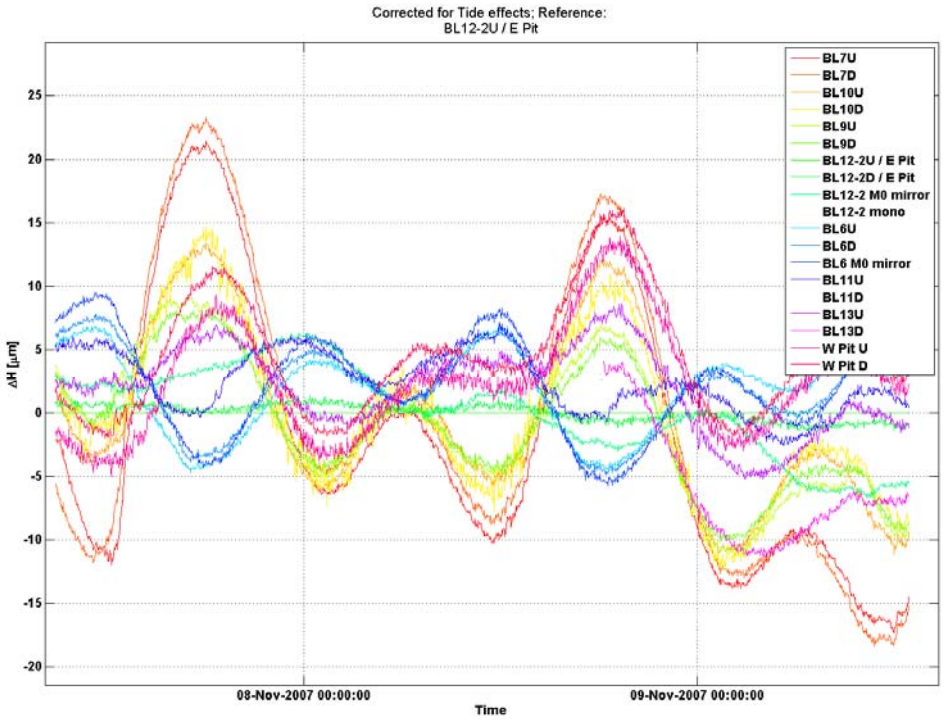

Figure 2: Relative height changes on the SPEAR3 floor in relation to BL12 ID.

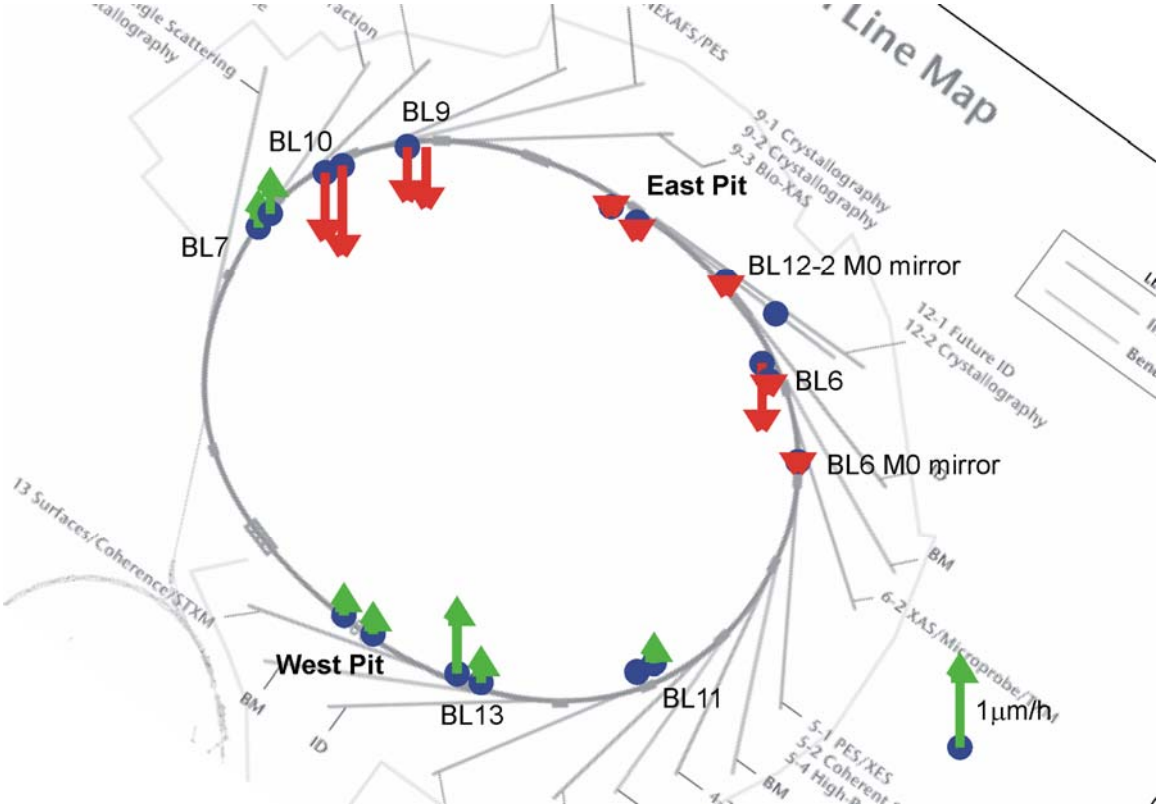

Figure 3: Trend of movement for the past 4 hours (11-9-2007 12:00pm)