

Table 1. A summary of the accumulated science time and the science time duty cycle of the GEO 600 detector during the S5 LSC science run so far (21 January 2006 to 1 October 2007).

| Period | Duration (days) | Accumulated science time (days) | Science time duty cycle (%) |
|------------|-----------------|---------------------------------|-----------------------------|
| N&W-mode 1 | 100 | 46.5 | 46.5 |
| 24/7-mode | 168 | 152.4 | 90.7 |
| N&W-mode 2 | 350 | 222.6 | 63.6 |
| Total | 618 | 421.5 | 68.2 |

science time duty cycle as high as possible. Only very short maintenance periods took place for re-measuring noise transfer functions. Overall in 24/7-mode an instrumental duty cycle of about 95% and a science time duty cycle of more than 90% were achieved.

An average peak sensitivity of better than $3 \times 10^{-22} \text{ Hz}^{-1/2}$ was obtained. Detailed information about the performance of GEO 600 is generated automatically and stored on websites called *GEO 600 reports*, which contain comprehensive information about sensitivity, data quality, calibration and glitchiness of the instrument.

4.3. Night- and weekend-mode, period 2

In a trade-off-decision in October 2006 the following three points were taken into account:

- the necessity for maintenance of the infrastructure,
- the chance to improve the sensitivity with further commissioning work, in order to maximize the science impact of GEO 600 during off-line times of the other detectors in the network,
- the continuation of acquisition of science data at the current sensitivity in coincidence with the LIGO detectors.

With input from the LSC data analysis groups, the LSC operations committee and a detailed benefit/risk analysis of the GEO 600 commissioning team, the decision was made to take the GEO detector out of the 24/7 mode (see also section 5). On 16 October 2006, GEO 600 started a second period of night- and weekend-mode. The beginning of this period was dedicated mainly to non-invasive investigations necessary for future planning of the detector operation. Then in 2007 the work shifted towards invasive hardware changes in order to increase the reliability of the instrument and to reduce its glitch rate. Furthermore, investigations of the limits to the sensitivity were performed in this period, as described in section 3.

4.4. Summary of S5

Overall GEO 600 collected about 415 days of well calibrated and characterized science data in the period between January 2006 and October 2007. Table 1 gives an overview of the accumulated science time and duty cycle for the three different periods of S5.

5. Future plans

Since the three LIGO detectors and VIRGO are shutting down their interferometers for installation and commissioning of enhanced LIGO and Virgo+ in 2008, it was decided that GEO 600 will have a long science data taking to cover this period. This program is now active under the name *astrowatch*. The main focus of this period will be to run GEO 600 in

data taking mode with a high duty cycle. However within this period, we will still allow for commissioning work at a low level, that involves necessary maintenance work, but can involve sensitivity improvements, whenever a risk/benefit analysis is in favour of such work.

In addition to this, we intend to perform further experiments of the dc-readout scheme for the tuned signal-recycling state. This configuration seems also to be promising for the application of squeezed light, which is considered to be part of the medium- to long term future of GEO 600, namely GEO-HF.

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