EUROMET PROJECT
FINAL REPORT

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5.	Participating countries: AT, CZ, HU, PL, RO, BIPM		
6.	Title: Intercomparison of iodine stabilised He-Ne lasers at 633 nm		

7. Progress:

Six different lasers took part in the comparison at the BEV (Austria). During one week matrix (defg) measurements between each laser and BIPMP3 were performed daily and all other combinations were at least measured once (50 measurements altogether). For the determination of the frequency stability several sets of relative Allan standard deviation measurements were made, usually over night.

The values of the set parameters which affect laser frequency were measured after each matrix measurement (intracavity power, cold finger temperature, and modulation width). Laser output has been determined with a silicon trap detector, the modulation width according to the method developed at the CMI.

The coefficients for the power effect of lasers OMH1, GUM1 and RO1 have been determined. For RO1 also the coefficients for the iodine pressure, modulation width and DC-offset were measured during this comparision.

It has been verified that the performance of lasers used in the different laboratories is capable of satisfying the requirements set by the CIPM in the practical realization of the definition of the metre (1997). The observed range of corrected frequency differences to laser BIPM4 was –20.6 kHz (RO1) to +6.2 kHz (BEV1). This result is inside the 2σ standard uncertainty (24 kHz).

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