Questionnaire
previous to the 2007 meeting of the
CCL-CCTF Frequency Standards Working Group

Note: Results will be considered only if there is a publication or at least acceptance for publication at the date of the meeting.

1. Have you made absolute frequency measurements of radiations included in the CCL list of recommended radiations (Mise en Pratique 2005)?

   Yes [X] No [ ]

   If yes, please list the values and uncertainties obtained and the methods used and refer to the publication(s) in which they may be found. Please be sure to include measurements made in other laboratories in your country.

   CMI performed repeated measurements of several wavelength standards with modified Menlo Systems comb FC 8004 referenced to (calibrated) GPS Rb clock. The results are summarized in

   [1] P. Balling, P. Kren, Absolute frequency measurements of wavelength standards 532 nm, 543 nm, 633 nm and 1540 nm, submitted to European Physical Journal D (Topical issue Metrology and optical frequency combs, Editor: Harald Schnatz)

   633 nm - $^{127}I_2$ 11-5 R(127)
   CMI laser PLO2 was measured in 2006 and 2007, average value of component f
   $f_{(PLO3@f)}$ = (473 612 353 618 ±2) kHz,
   (in agreement with value obtained for this laser with BIPM comb in 2003)

   Slovak laser SMU-1 was measured during few days in May 2006
   $f_{(SMU-1@f)}$ = (473 612 353 607.1 ±0.5) kHz,

   (components d..j were also measured for both lasers)

543nm - Frequencies of 22 hyperfine components of 26-0, R(12) (a_x) and 28-0, R(106) (b_x) transitions detected by third harmonic technique in 50cm long external iodine cell absolutely measured several times during 2006-2007. The average frequency of reference component b_{10} is
$f_{(PLG2@b10)}$ = (551 580 162 398 ± 2) kHz,

532nm - Reference component a_{10} of transition 32-0 R(56) in $^{127}I_2$ detected with laser CMI YAG1 was measured several times by fs comb in CMI since late 2005 and once by fs comb in BEV (2007). The average value for 2 mm beam with 2 mW power, 1.5 MHz p-p modulation and iodine pressure 0.85 Pa (cell finger temperature -15°C) is
$f_{(CMI\ YAG1@a10)}$ = (563 260 223 514.7 ± 1.0) kHz

In addition a_1, a_2, a_5 to a_{15} of 32-0 R(56) transition were measured repeatedly and frequency differences from a10 agree to better than 1 kHz with those in MeP.

1542nm
The frequencies of P(16), P(15) and P(14) (second harmonic ~770nm) of $^{13}C_2H_2$ were

measured in 2006 by fs comb of CMI. The values are about 1kHz lower than that obtained in 2005 - i.e. (0.9 to 2.6) kHz below MeP 2005 values.

	vac wavelength nm	frequency of CMI Ethyn-1 2006 kHz
P(16)	1542.384	194 369 569 383.1 ± 2
P(15)	1541.772	194 446 632 389.6 ± 2
P(14)	1541.167	194 523 020 607.4 ± 2

1.1. If yes, indicate for each one whether you think that any of these measurements should modify the current value and uncertainty already on the list.

Yes ☐ No ☒

(add as many lines as necessary)

2. Have you made absolute frequency measurements of radiations included in the CCTF list of secondary representations of the second?

Yes ☐ No ☒

2.1. If yes, please list the values and uncertainties obtained and the methods used and refer to the publication in which they may be found. Please be sure to include measurements made in other laboratories in your country.

2.2. If yes, indicate for each one whether you think that any of these measurements should be proposed as an update of existing value and uncertainty to be considered at the next CCL-CCTF Joint WG meeting just prior to the CCTF (2008/2009).

Yes ☐ No ☐

(add as many lines as necessary)

3. Have you made absolute frequency measurements of other radiations <u>not</u> included in these lists?

Yes ☐ No ☒

If yes, please list the values and uncertainties obtained and the methods used and refer to the publication in which they may be found. Please be sure to include measurements made in other laboratories in your country.

3.1. If yes, indicate if any of these sources should be included in a updated list of "Recommended values of standard frequencies for applications including the practical realization of the metre and secondary representations of the second, and present your arguments for a positive assessment.

Recommended for the MeP:

Yes ☐ No ☐

Recommended for secondary representation of the second

Yes ☐ No ☐

(add as many lines as necessary)

4. Are you currently developing new frequency sources or are you aware of such sources developed in your country?

Yes ☐ No ☒

If yes, please give a brief description of your experiment.

NAME: ……Petr Balling……

INSTITUTE: ……CMI……