



Approved by the CIPM in June 2013

## RECOMMENDED VALUES OF STANDARD FREQUENCIES FOR APPLICATIONS INCLUDING THE PRACTICAL REALIZATION OF THE METRE AND SECONDARY REPRESENTATIONS OF THE DEFINITION OF THE SECOND

### STRONTIUM 87 ATOM ( $f \approx 429$ THz)

$^{87}\text{Sr}$  atoms,  $5s^2\ ^1\text{S}_0 - 5s5p\ ^3\text{P}_0$  unperturbed optical transition

#### 1. Recommended value [1] of the frequency

$$f(^{87}\text{Sr}) = 429\,228\,004\,229\,873.4\ \text{Hz}$$

equivalent to

$$\lambda(^{87}\text{Sr}) = 698\,445\,709.612\,754\ \text{fm},$$

with a relative standard uncertainty of  $1 \times 10^{-15}$ .

This radiation was already endorsed as a secondary representation of the definition of the second.

#### 2. Source data

$$\text{Adopted value} \quad f(^{87}\text{Sr}) = 429\,228\,004\,229\,873.4\ \text{Hz} \quad u_c/y = 1 \times 10^{-15}$$

calculated from

$f(^{87}\text{Sr}) / \text{Hz}$	$u / \text{Hz}$	source data
429 228 004 229 873.65	0.37	[2]
429 228 004 229 873.6	1.1	[3]
429 228 004 229 874.1	2.4	[4]
429 228 004 229 872.9	0.5	[5]
429 228 004 229 873.9	1.4	[6]

by a weighted mean.

Given the common contributions to the uncertainty (e.g. the black body correction) the CCTF considered it prudent to estimate a relative standard uncertainty of  $1 \times 10^{-15}$ .

#### 3. References

[1] CIPM Recommendation 1(CI-2013): Updates to the list of standard frequencies.

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