The Act of Measurement III: The Land Speed Record

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Abstract

The act of measurement has caused the world land speed record to take up discrete values directly related to the speed of light.

1 Introduction

In *The Act of Measurement I* [1] astronomical distances were shown to adopt, *on measurement*, values related to the Planck length through multiplication by specific powers of π and e. The distance d_* measured between Earth and a star, for example, is given by the equations:

$$d_* = \pi^{n_i}\, l_{\text{Planck}} \tag{1}$$

$$d_* = \mathrm{e}^{n_j}\, l_{\text{Planck}} \tag{2}$$

where n_i and n_j take integer, half-integer, quarter-integer, eighth-integer etc values.[1] Despite the inconstancy of stellar distances n_i and n_j are found to take discrete values. For example: the distance between Earth and Sirius equals $\pi^{104}\, l_{\text{Planck}}$; the distance between Earth and Arcturus equals $\mathrm{e}^{120.5}\, l_{\text{Planck}}$; the distance between Earth and Regulus equals $\mathrm{e}^{121.25}\, l_{\text{Planck}}$; and the distance between Earth and Proxima Centauri equals $\pi^{103.375}\, l_{\text{Planck}}$. Integer and half-integer values of n_i and n_j are *most probably*[2] taken by bright stars. The light travel times measured from quasars are similarly related to the Planck time.

In *The Act of Measurement II* [2] the results of some simple experiments showed that the masses of, and the distances between, mundane objects are also found on measurement to be related to Planck scale through multiplication by integer and discrete fractional powers of π and e.

For all measured values in [1] and [2] one of the numbers n_i or n_j was found to be either an integer or an improper fraction whose denominator is 2^p, where p = 1, 2, 3, 4, 5 or 6.

The world land speed record provides us with a bank of precise data with which to ascertain whether speed, in addition to distance, time and mass, takes up discrete values when measured.

2 The Land Speed Record

The record speeds v_r achieved since 1939 are shown in Table 1. The values presented are the mean values in km.h^{-1} of two passes in opposite directions over a course one mile in length.

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[1] In [1] and [2] n_i and n_j were called n_{1c} and n_{3c} respectively.

[2] Specific values are taken on a probabilistic basis.

Year	Driver	Vehicle	Speed (km.h^{-1})
1939	J. Cobb	Railton Special	592.091
1947	J. Cobb	Railton Mobil Special	634.39
1964	D. Campbell	Bluebird CN7	648.73[3]
1963	C. Breedlove	Spirit of America	655.722
1964	T. Green	Wingfoot Express	665.0
1964	A. Arfons	Green Monster	698.50
1964	C. Breedlove	Spirit of America	754.330
1964	C. Breedlove	Spirit of America	846.961
1964	A. Arfons	Green Monster	863.751
1965	C. Breedlove	Spirit of America – Sonic 1	893.966
1965	A. Arfons	Green Monster	927.872
1965	C. Breedlove	Spirit of America – Sonic 1	966.574
1970	G. Gabelich	Blue Flame	1001.667
1983	R. Noble	Thrust2	1019.47
1997	A. Green	ThrustSSC	1149.303
1997	A. Green	ThrustSSC	1227.986

Table 1: World land speed records since 1939 [3]

The record speeds are expressed as the speed of light c = 2.99792458 x 10^8 m.s^{-1} [4] – the Planck speed – divided by powers n_i and n_j, respectively, of π and e:

$$v_r = \pi^{-n_i}\,\mathrm{c} \tag{3}$$

$$v_r = \mathrm{e}^{-n_j}\,\mathrm{c} \tag{4}$$

From (3) and (4):

$$n_i = -\frac{\ln\left(\frac{v_\mathrm{r}}{\mathrm{c}}\right)}{\ln(\pi)} \tag{5}$$

$$n_j = -\ln\left(\frac{v_\mathrm{r}}{\mathrm{c}}\right) \tag{6}$$

The exponents n_i and n_j are plotted as points (n_i, n_j) in Figure 1. Since $n_j = n_i \ln(\pi)$ the points lie on a straight line. The vertical and horizontal lines signify the levels and sub-levels of the *i* and *j* series, which descend from the speed of light in geometric sequence with common ratio π and e, respectively. The record speeds occupy sub-levels. In other words the speeds are equal to the speed of light divided by discrete fractional powers of π and e. This finding is consistent with the findings of [1] and [2].

[3] Last wheel-driven absolute land speed record. Superseded by later ratification of Spirit of America, 1963.

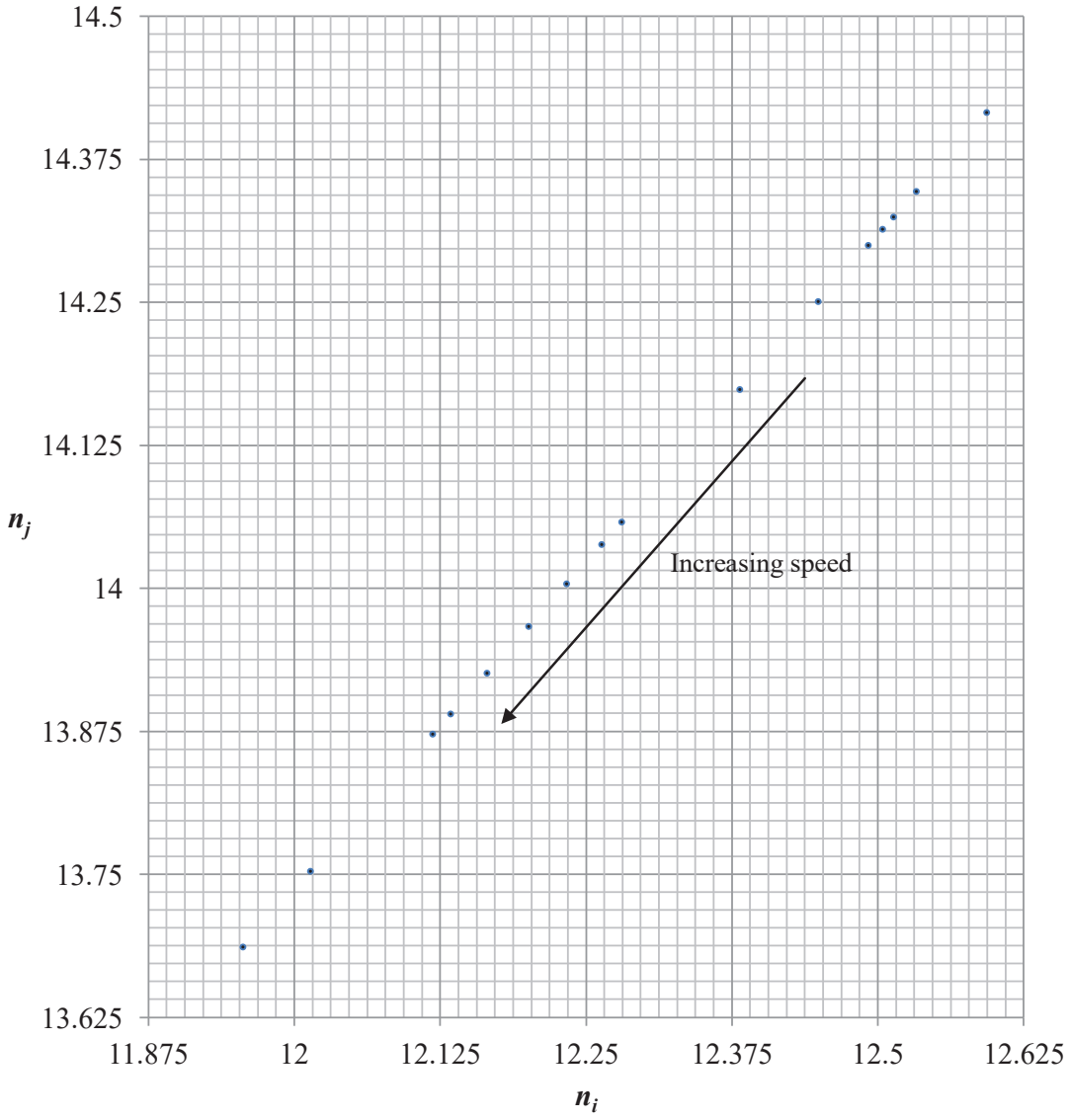

Figure 1: The graph of n_i vs n_j for the world land speed records held since 1939

In the classical world of long distances and large masses, as in the quantum world, the act of measurement perturbs the system (constituting the observer and the observed) and causes it to collapse into a definite state, with a definite value of the observable (in this paper, speed), on a probabilistic basis.

References

1. B. F. Riley, 'The Act of Measurement I: Astronomical Distances', viXra:2006.0247
2. B. F. Riley, 'The Act of Measurement II: Closer to Home', viXra:2006.0246
3. Records Lists, Fédération de l'Automobile
4. 2018 CODATA recommended values