



LATVIJAS
UNIVERSITĀTE

ANNO 1919

Kvantu sūkņu teorija

Vjačeslavs Kaščejevs, Ph.D.

LU Fizikas un matemātikas fakultātes
vad. pētnieks un asoc. profesors
LZA koresp. loceklis

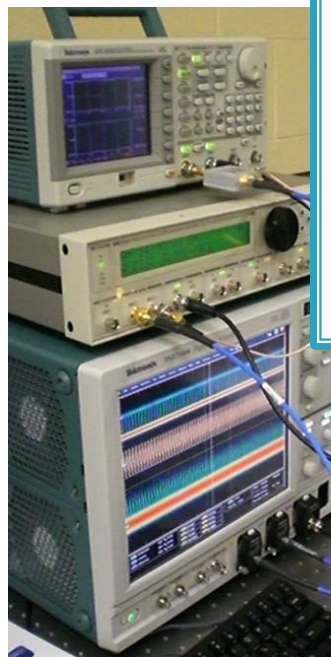


1,5 V
1 €



1,42 V
10 €

Kvantu metroloģija
zinātne par visprecīzākiem
mērījumiem fundamentālās fizikas
un augsto tehnoloģiju krustpunktā



1,41702804 V

> 1.000.000 €

1,41703 V

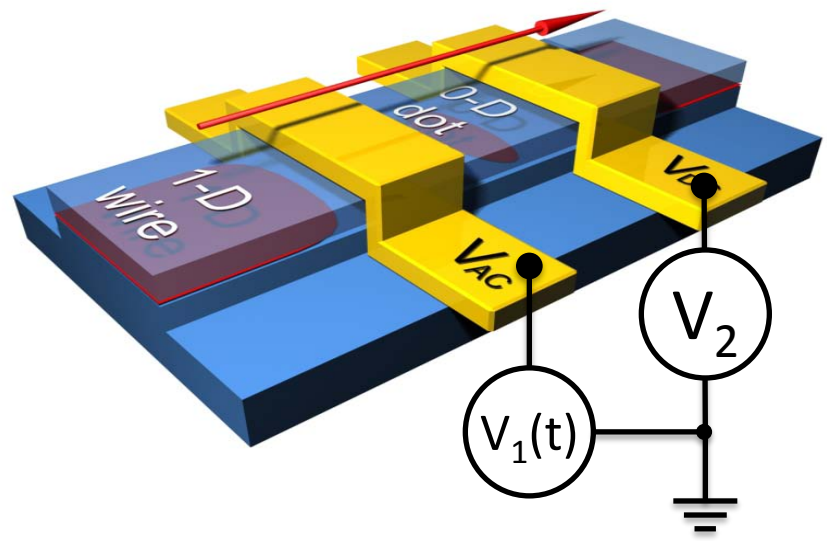
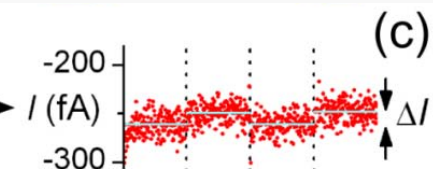
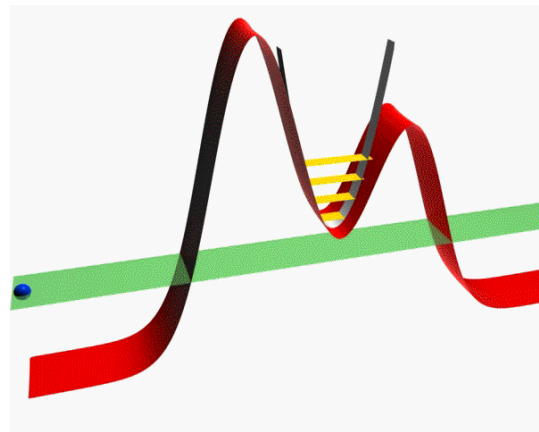
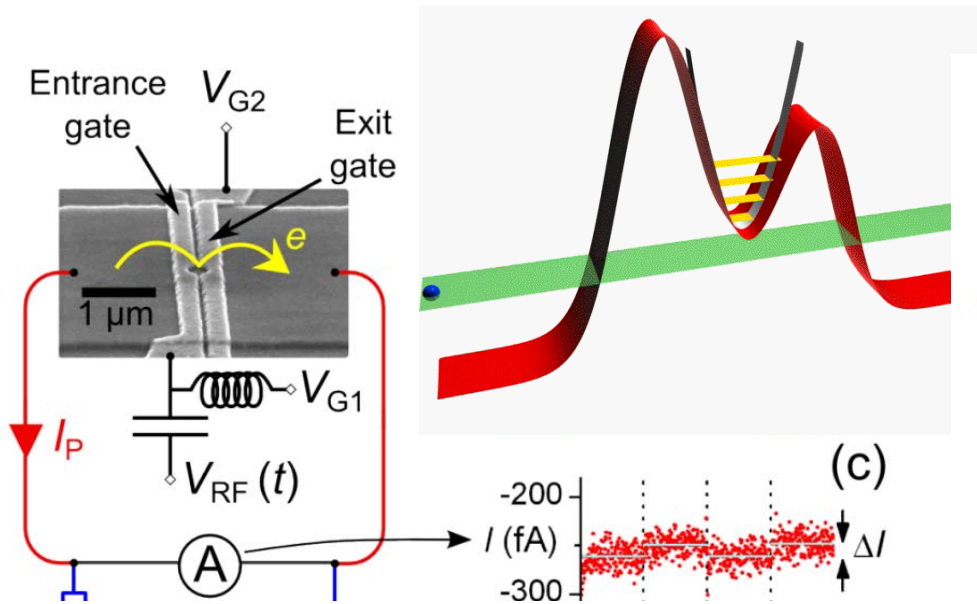
10.000 €



Kas ir kvantu sūknis?

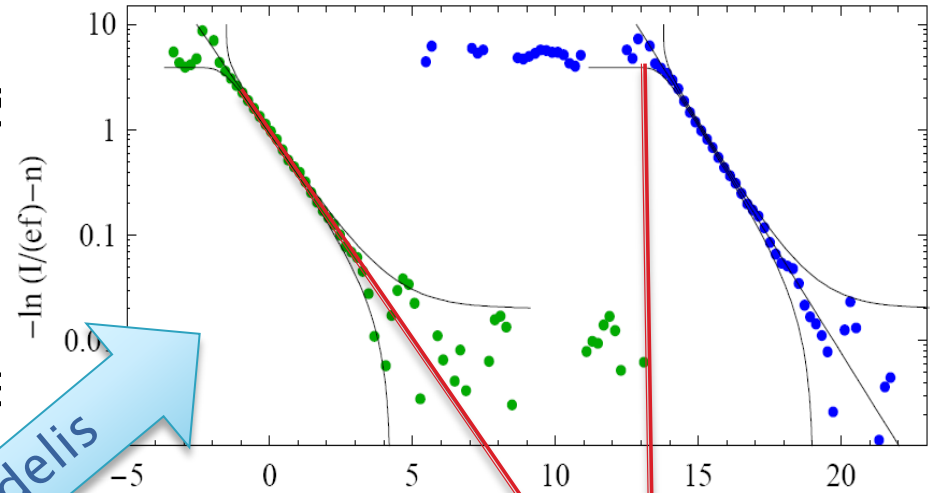
- ▶ Nemainīgas strāvas “baterija”, kas piesaista strāvas vērtību I takts frekvences f un lādiņa kvanta e reizinājumam

$$I = ef$$

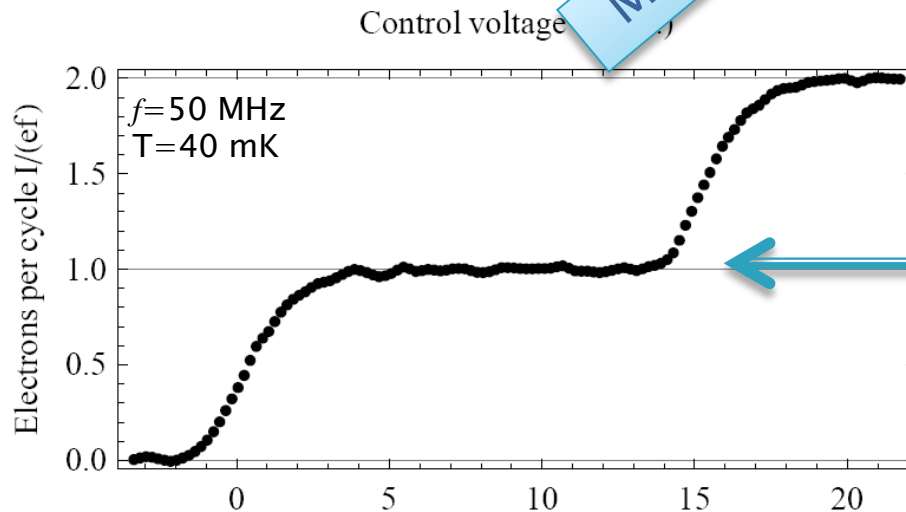


Cik precīzs ir kvantu sūknis?

- ▶ Saprasti galvenie fiz
- ▶ Radīts adekvāts ma
- ▶ **Modeļa praktiskā vē**
 - no rupjiem mērījumiem kvantu sūkņa absolūt



Modelis



!!!

$$I = ef \approx 0.00000000000008 \text{ A}$$

???



Counting Statistics for Electron Capture in a Dynamic Quantum Dot

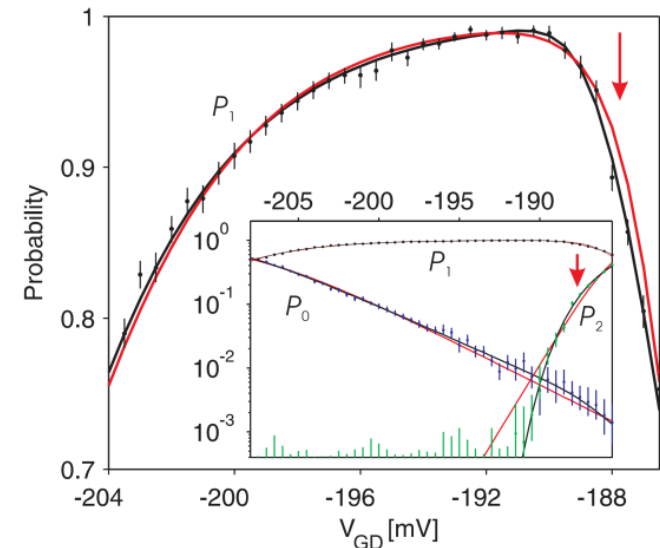
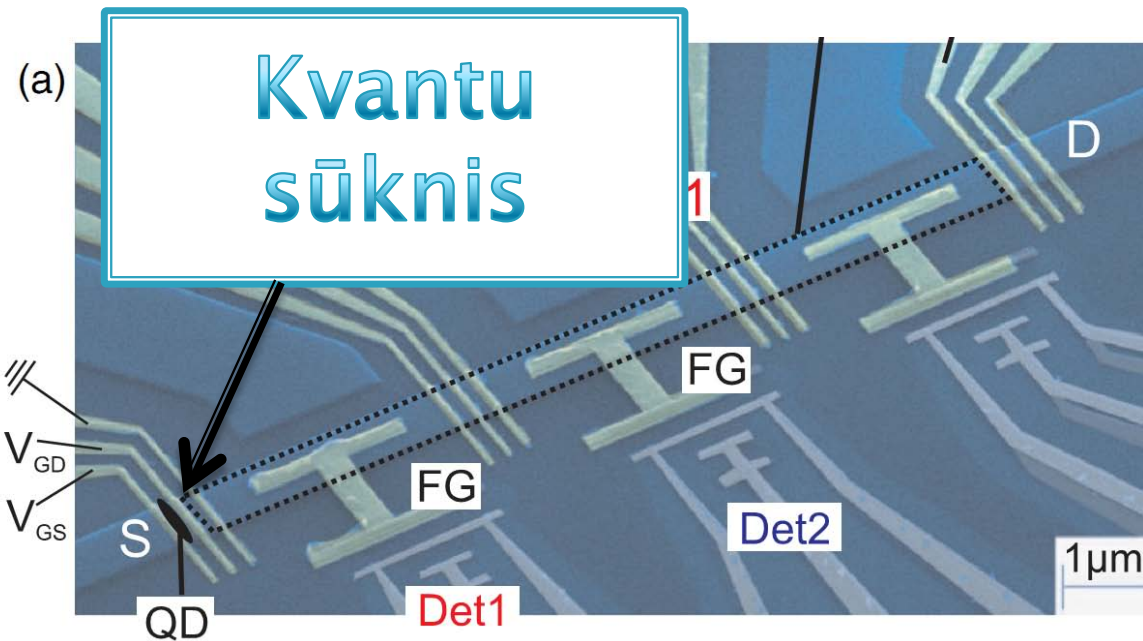
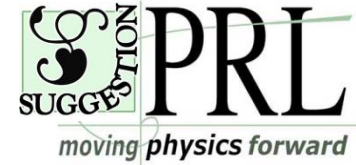
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Pasaules ekonomiskā foruma Young Scientist'2013 balva

For pioneering research on single-electron quantum pumps, establishing the theoretical foundation for using quantum dynamic dots – semiconductors made of nanocrystals – to redefine the Ampere, the unit of electrical current. Kascheyevs' research has important implications for the future of information and communication technologies.



LU – projekta “Quantum Ampere” izcilības partnere



-  Nacionālās metroloģijas laboratorijas
-  Zinātniskās izcilības partneri