

Chasing time

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Propositions accompanying the dissertation

Chasing Time

Robbert Geertsema

1. Currently there is no sensor technique that perform perfectly under all conditions - all techniques sacrifice on at least something: such as radiation hardness, spatial or temporal resolution, or signal height.
2. The addition of temporal information in the tracking and vertexing of the VELO is of key essence for operation during Upgrade 2 of LHCb.
3. Two-photon absorption is an invaluable tool for the characterisation and understanding of the performance of silicon sensors in high energy physics, since it enables detailed three dimensional characterisation of the sensor volume.
4. To utilize the full temporal potential of the Timepix4 ASIC, not only the timewalk needs to be corrected, but the non-uniformity of all TDC bins in each pixel need to be characterised and corrected for, otherwise the optimal time resolution cannot be achieved.
5. New characterisation techniques need to be developed alongside the development of silicon sensors, otherwise novel sensor techniques cannot be characterised.
6. The quest for discovery at the LHC drives the development of new technologies, which eventually find their application outside of physics.
7. The current temporal resolution of full-scale small-pitch ASICs in combination with silicon sensors is not sufficient to implement them in the next generation of high energy physics experiments.
8. “We are not at the end but at the beginning of a new physics. But whatever we find, there will always be new horizons continually awaiting us.”

- Michio Kaku

9. It is important to do everything with passion, it embellishes life enormously.

- Lev Davidovich Landau