THE CPT (CHARGE, PARITY, TIME) SYMMETRY BREAKING-BASED QUANTUM OPTICAL TELECOMMUNICATIONAL INVENTION AND ITS APPLICATION TO THE SPACE AND PLANETARY SCIENCES. F. Homor[1] and A. Gucsik[2], [1]Sopron, Pf. 210, Hungary (E-mail: cpt.researcher.group@gmail.com, ferenchomor@gmail.com) [2]Eszterházy Károly University, Széchenyi tér 1. 3300, Eger, Hungary. (E-mail: sopronianglicus@gmail.com, cpt.researcher.group@gmail.com).

Introduction: In this description Homor and Gucsik [1], we have previously described our innovation as well as our invention, which were before patenting, to clarify several factors, as follows. The present invention is now patented, so we can describe the features of this Conference.

All solutions to the invention are based on the content of the patent application, in which for the purpose of data transmission or long-distance status detection (e.g., astronomical investigations - space exploration, nanoscopic-femtoscopic examinations, etc.) is due to the gravity-driven charge-parity-time (CPT) symmetry breaking features.

The non-separable as well as locally-developed state function (quantum entanglement) is modified by the gravity [2-5], as follows.

Invention: The patent application uses locally generated quantum entanglement relationships on specially designed, distributed geometry structures (like topological invariants) that are modified along a global function - *Gravity Operator*: which intertwined states locally change, based on globally intertwined, complex quantum entanglement relationships.

A new type of quantum merger (globally complex Qantum entanglement) was created with a separate wave-receiver or tax/receiver pairs (or broadcast and transceivers). This connection does not occur directly in the field of the space-time interval (traditional term: currently associated with the characterization of the four-pulse invariance). Because, in a way, there is no direct spatial relationship between the connection elements: because, at the same time, the locally coupled particle pairs do not pass through a long distance data link. The unique, separate, transmitter-to-customer, ie, local quantum entanglement, directionally-spaced structures (possibly transmitter-receiving units) are also manifested: this is a merger, which is based on our newly discovered CPT symmetry breaking phenomenon.

It is important to note that the CPT symmetry breaking phenomena was calculated by the theoretical way as well as measured by the lab experiments.

The data link, a special entangled quantum states phenomenon, is not based on the principles and methods listed below:

- The relationship is not based on one of the isolated states characterized by orthogonal quantum numbers, so the measurement always wants to reveal the effect of the global variable. It can also be created a relationship on the multiple geometries (structural configurations), while maintaining the basic features described above. In other compositions, e.g. we change the tax/receiver geometry, but we use the characteristics of the globally emerging CPT symmetry breaking phenomenon (applied in globally intertwined eg tax/receiver data channel units). That is, the quantum entanglement phenomenon used in previous interpretations and its use does not include the principle and methods of our procedure.
- In our case, it is not necessary to measure single photon timeline (or beam case) interference for known quantum eraser experiments, for signal discrepancy and information detection (eg quantum entanglement experiments based on known optical parametric down conversion).
- There is no need to use single photon technology (but it is possible to do so), instead of using a much simpler laser beam measurement (e.g., power or photon number detection).
- We do not send spatially (eg between tax/receiver pairs): a signal that changes the spatial Hamilton function on the quantum channel, for data transmission
- for data transmission: it is completely intertwined globally - in a remote, distributed geometry system, specially designed data traffic Based on CPT symmetry breaking phenomenon.
- The invention is based on a newly discovered physical process, the CPT symmetry breaking phenomenon that develops according to global physical variables, modifying the traditionally acquired quantum entanglement phenomenon.
- In addition to the quantum optic, quasi-photon-based design, the method can be applied to other quantum entanglement cases: however, there is a need to replace the optical elements and the corresponding split geometry with the solutions required for that particle. Such particles may include: electron, proton, neutron, nucleus, quasi-particles (or, for example, channels or cases formed according to the two states of quantum statistics), and so on.

The laser optic solution can also be implemented on a variety of laser optics (according to the wiring diagrams), as well as the creation of data transmission channels associated with said other "particles":

- telecommunication channels,

- data channels for detection procedures are e.g., space data, astronomy, material and other test equipment (eg telescopes, other star and space equipment, analytical laboratory tools, etc.),
- internal and external channels of computing equipment as described above.

Conclusions: In this study, the first use of the CPT symmetry breaking effect can open a new field of the telecommunication, and analytical systems, especially in the new special advanced communication with satellites as well as probes to the planetary missions, for instance. This solution will open up a new chapter in quantum physics in theoretical research, and will help to develop new technical solutions that will create new opportunities in the space sciences, astronomy and space technology. With the application of our invention and our discoveries, in addition to the technical advantages, worldwide energy savings can be achieved, which will greatly reduce the human footprint of Biological Footprint in areas of application.

Acknowledgements: Authors are grateful for Dr Imre Sánta at the University of Pécs (Pécs, Hungary), who developed and made all of the required experiments for the study above. Authors are grateful for Mr. Lars Kann-Rasmussen (VELUX Group: VKR Holding A/S, Hørsholm, Denmark), who has spent a significant amount of money on carrying out the verification of the Innovation - Invention concept, supporting further research and development. Authors are thankful for Mr István Murányi (Sopron, Hungary) for his financial support. Authors are thankful for Mr Dávid Winkler (Sopron, Hungary) due to the management of business opportunities.

References: [1] Homor F. and Gucsik A. (2018) 49th *LPSC*. [2] Walborn S.P. et al. (2002) *Phys. Rev. A*, 65, 033818. [3] Kim Y-H. et al. (2000) *Phys.Rev.Lett.* 84:1-5. [4] Berestetskii V. B. et al. (2010) Elméleti fizikai IV. (In Hungarian), pp. 753. (ISBN-13 978-963-2791-31-9. [5] Choi C. Q. (2018) Is Gravity Quantum? - *Scientific American*.