Paradox of twins –Jiri Langer

Is it possible to explain paradox of twins within special theory of relativity?

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What paradox of twins means? One of the headstone of the special theory of relativity is relative dilatation of the time. Time on clock that is in motion toward inertial reference system in which inertia principle applies runs slower than clock that is in quiescent condition in that inertial reference system. ← Even this is not exact formulation. Secondly: where is determination of who or which observer proclaims that statement ? It's utterly necessary to be told that the basic observer is placed into basic reference system which is determined to be placed in quiescent conditions. In such system there are all objects of the whole universe. So that there is moving object = clock in this basic system that is under quiescent conditions of the straight –line motion. On the clock itself the rate of time unwinding is not changing but what is changing is information about time slowing down if clock is moving toward our reference system. This slowing-down of the time depends only upon velocity of the clock motion but not on acceleration toward inercial reference system. This also doesn't make sense.!! In order to clock – mechanism producing time intervals to get still higher and higher velocity, it has to be accelerated (clock in rocket). Physically only acceleration can lead to higher velocities or in other words, velocity by principle cannot be changed without process of acceleration. So that although we can't find dilatation of the time during process of acceleration still different dilatations of the time depend on accelerated motion of the clock. Slowing-down of the time rate then depends on that acceleration of the clock motion scanned to the observer in inercial reference system. Slowing-down of the time rate cannot happen without previous acceleration. Until this accelerated motion is to be changed to the steady one then we can observe, analyze, determine the „stop state" of this velocity and to perceive rate of that slowed-down time. This matter of fact is very well verified experimentally. Mr. Langer, what is reliably verified ? What ? Whole procedure is described unreliably here by Mr. Langer. Efect depends on square power of ratio between velocity of the clock ((Mr. Langer, do not use please the word „velocity" of the clock use „rate of time flow"instead... with the word velocity there is another physical phenomenon designated)). motion and speed of light and therefore it's insignificantly small under common circumstances.

If we're impatiently walking alongside corridor waiting in the office for someone to be heard we are doing well from the view of STR because our time is running slower that time of seated person. Difference in time passed through is too small to be detected even with the best clock ever made. Even to this naive stupidity it's necessary to make notice that no watch or clock respectively ever changes its own rate of the time running. Just one of those observers can „observe" of how the other clock on side of that second observer is slowing down..We would save no more that just 20 percent of the time even to be walking with velocity equal to

half of speed of light. Who are „we“? We as a pilot on the rocket or „we“ as an observer on the Earth? ... Mr. Langer obviously makes STR to be ridiculous. However scope of the efect dramatically rises up at velocity closed to speed of light which is the case of the particles moving in accelerators or in cosmic radiation.

This effect was popularized by example given by Albert Einstein himself. The rocket is leaving the Earth on which board there one of twins is travelling whereas the second one stands on the Earth. (Twins represent two identically constructed clocks. O.K.) Spacecraft will accelerate But Mr.Langer clearly declared that „a c c e l e r a t i n g has got nothimg to do with slowing-down time. to the velocity very close to speed of light then it turn back itself somewhere in the universe and return at the Earth again. Twins are met together but that one who stayed on the Earth is much older that another one. It is , of course, very bad and misrepresented interpretation.! It sounds uncommonly but it doesn't concern any kind of paradox so far. Paradox will come when spaceman will make wrong reasoning. (However following reasoning doesn't belong to the spaceman but to Mr. Langer and that's why it is wrong. Spaceman „Z“ would not make such mistake. His reasoning I will describe later. :**: All motion is relative according to theory of relativity. During my journey I have observed that the Earth is moving apart from me by certain velocity , then it has turned back and begun to come near me again. From this point of relativity the time on the clock placed on the Earth should run slower that time on the clock placed nearby me. Person on the Earth can become younger than I on the spacecraft. After both brothers to be met together there is no chance to argue with relativity of the motion. Their mutual age will be at the end compared within only reference system.

What does special principle of relativity declare ? According to its basic postulate all inertial systems are coequal. O.K. If we are placed into isolated room without any windows we cannot decide whether that room is or not toward this certain inertial system in equal straightforward motion. O.K. Where can a mistake be found then? In the spaceman's reflection ? We postulated - not we but Mr.Langer postulated that. the time on moving clock to be unwinded slowly – time is not unwinding slowly on any of both of the clocks. The problem lies in observer and its inertial system.Just an observer together with its inertial reference system, if he is positioned into quiescent state by choice then such observer will observe information coming from moving spacecraft to be deformed into form of dilatation of the time. „There“ time is dilating because of relativistic speed of the spacecraft but in the spacecraft itself there no dilatation of the time is observed. Only we – here on the Earth are getting deformed information about time because of curled inertial system on the spacecraft. if moving toward inertial system but the system linked to the spacecraft is not inertial !

? Attention ! Spacecraft can have and has two kinds of motion: Partly when it's accelerating then bearing its own non-inertial system that has to be comprehended as non-inertial by observer as well. At the moment when the spacecraft is changing this unequal motion to the equal one its reference system is also automatically changing fro unequal into equal one. Otherwise the rocket could not be accelerated and could not come back. Such stupid reasoning would not be said by inteligent spaceman. Paradox from the view of non-inertial system is widely disscussed in textbooks of the GTR because necessary mathematical instrument is nearly identical with that one of the GTR. But mostly it's mere transcript of relations of the STR into non-inertial systems. ?? thus it is concerning theory of the plane

space-time within general coordinates ?? But STR doesn't concern general space-time and plane environment. STR concerns equal MOTION of the system connected to the body also in motion and ... and this „intrinsic" referential system of the body is „nested" into coordinating system of the observer who then evaluates some relativistic efects as they are for example dilatation, contraction and changes in mass. Whole that observer's system, thus system coupled with the observer and with that intrinsic system ofthe body that's moving within observer's system can then be both considered to be nested into some space-time perhaps plane one, perhaps less plane oneand perhaps even into foam-like space-time.. This theory is analogy of the interpretation of the Newtonian mechanics in non-inertial systems. Where mathematical difficulty of this extension is not significant. It is understood that General Theory of Relativity is theory of the curved space-time.**Mr Langer did not explain STR yet and begins to bring GTR here....** ,then theory of real gravitational field induced by distribution of tha mass object which is matter more or less of the terminology.
Potential of apparent forces is responsible for speciousness. Forces that cause trouble to us what does it mean the term to us..?? To us as an observer on a car park, or to us in the car or to us somewhere on very distant quasar ? This is an imperfect interpretation where author ignores reference systems, he doesn't determine them first and also if so then he would not pay attention to them upon his interpretation... in the hardly braking car there are so called apparent forces. For whom ? Everyone who caused his head to be painful by making a bumb on his forehead will not be keen to admit the bumb to be caused by apparent force. Bumb is caused by right force by which the glass acted upon his forehead but impact itself was caused by acting apparent force during braking car and keeping passenger's body to be moving forward with accelerated motion. From the point of outstanding observers' view the force begun to act upon the forehead until glass touched it not before. Therefore the force accelerating our man toward the car is specified as a the „apparent one". Simply put this is interpretation of the „kangaroo style"
Just thanks to the „apparent" forces astronaut in spaceraft has got different experience from his sibling on the Earth. He paid for his slower aging and this is what's going on:Mr Langer himself in his interpretation has criticized wrong thinking of astronaut (that beforehand he himself created in order to enable him to criticize it later) and now this wrong thinking is using again. Astronaut doesn't observe any ageing on himself...

by pushing his body into seat backrest during acceleration of the spacecraft and by observing and feeling overcharge in opposite direction during process of braking. Mr Langer here is wrongly mistaken if he proclaims that there is the same efect of slowing-down ageing in both motions of the spacecraft. Same efect when spacecraft is accelerating – increasing its velocity and also when it's braking. He considers and accepts slowing-down ageing also during slowed-down motion..
If sibling on the Earth will be satisfied just with qualitative explanation then he was ageing faster because of his free fall in the field of apparent forces indistinguishable from efects of the real momogenous gravitational field, all during accelerating and braking phases of the fly. Mathematical description of such situation will show then that the time on the clock on the Earth is from the view of the reference system linked to the spacecraft really running faster.I demonstrate my version and explanation here:
http://www.hypothesis-of-universe.com/docs/h/h_104.doc
http://www.hypothesis-of-universe.com/docs/h/h_103.jpg
http://www.hypothesis-of-universe.com/docs/h/h_102.doc
http://www.hypothesis-of-universe.com/docs/aa/aa_005.doc
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We can make objections against this interpretation. Let's imagine we have triplets. Two of them boarded spacecraft sand third one stayed on the Earth. Both of spacecrafts were accelerating to the velocity close to the speed of light during period of one year. After one year one of them begun to brake, spacecraft was turned back and at the end returned on the Earth.Second one continued in equal straightforward motion next a few years until it had been returned back to the Earth in the same way like his sibling. If we consider situation in light of inertial observers on the Earth we have to come into conclusion ...not **we** but Mr. Langer will conclude this ... and Papuan will conclude this differently...and Tibetan will conclude another conclusion.... I, for example, will come definitely to different conclusion that Mr. Langer.that after follow-up appointment the oldest one will be sibling who stayed on the Earth and the youngest that one who was flying at longest. Mr. Langer, where is your conclusions come from ? Beforehand we have told that running time faster on the clock on the Earth we can explain in light of the spacecrafts view by presence of field of apparent forces in system of those spacecrafts. However both of astronauts performed accelerating and braking manoeuvre in utterly same way, their experience and time durating of these periods are absolutely same, they both perceived impacts of apparent gravitational field for the same period of time. How then to explain difference in increment of time on the Earth clock from the point of view of the systems linked to the spacecrafts ? The answer is that rate of clock ticking in their systems doesn't depend upon intensity of the apparent gravitational field but upon its potential. There is same gravitational force acting upon us on fifth and tenth floor of the building but we have to perform much more effort to step up to tenth floor that fifth floor and vice versa. By free fall from tenth floor we'll get greater amount of kinetic energy than to be fallen from the fifth one. On the second floor there we've got more potential energy which represents product of our mass and potential of the gravitational field. And ticking of the clock, rate of ticking in non-inertial reference system depends on the potential not on intensity of the apparent gravitational field. When second astronaut performs turning manoeuvre the Earth is in longer distance that it was the case of his sibling. Therefore this guy is on the higher potential. It will be hard for me to describe this exactly with no corresponding mathematical apparatus. I would like to see this apparatus. I wonder if you have there finding that rate of time ticking is **accelerating when spacecraft is braking and has so negative value of sign of acceleration!** (whereas there is still important to keep in mind that on the spacecraft rate of time ticking remains the same and that only by us such kind of changes is observed, from here,from the inertial system of the observer) I want to demonstrate only that situation in systems linked to both spacecrafts is not identical even during turning manoeuvre and therefore description of time ticking on the clock on the Earth looks differently for each of cases mentioned above.

Paradox of twins as resource for cosmic testing and efects of dilatation of time including even efects of apparent and real gravitational fields and their undistinguishableness are very well and reliably experimentally verified at present. But though those are efects observed within inertial system of observer caused by reciprocal and mutual curling of both system of observer and systemof observed moving body.In the seventies of the 20tieth century Hafele and Keating took three identical standards of time, three identical clocks. They left one in the lab and the other two sent by planes for the journey around the world, one of them to the west and another one to the east. Because the Earth rotates toward the east and velocity of both of flies was approximately same it was added up to velocity of the Earth's spinning at the fly to

the east and subtracted from it at the fly to the west. Mutual curling of the „east“ plane and the „home“observer and also „west“ plane with the hoem observer is different therefore also dilatations are different. Resulting efect was tiny but still measurable and came out in accordance with theory. Clock flying to the east showed very tiny difference in dilatation but still a little big less dilatation was observed on the clock flying to the west compared to the clock placed into the lab. O.K. that's the result of two different curling of inertial reference systems on succession of their stop states.(Usability of dilatation of time for cosmic travelling has been sometimes impeached in that way that human ageing is something utterly different than running ideal clocks)

Let's suppose the spacecraft to be moving with the constant acceleration so that during whole period of the flying astronaut has to feel same weight as when he is placed on the Earth. So that both of them on the spacecraft and on the Earth are ageing in the same rate .... but each of them to be taken separately as an observer of the other one will observe „curled“information and thus he will evaluate observed facts as relativistic efects. If influence of apparent gravitation applies in the same way like that of the real gravitational field then it seems to be logical assumption that astronaut will be ageing in the same rate toward his own clock like his earthly colleague toward identical clock on the Earth. !!! Eureka ! Eventually here is said that time on the spacecraft is running in the same rate like here on the Earth. But ....but.. One of the observer,that one with his inertial reference system in quiescence „observes“ dilatation or contraction at the other one's system.because systems are mutually curled. This principle of equivalence of the „apparent“ and „real“ gravity is though basic stone of general theory of relativity. GTR is so approaching us anyway. . From this point of view it seems to be science fiction that „astronauts are ageing slowly“. If the journy of the astronaut still feeling the earthly size of the weight wii take one year from his point of view a difference in adding up time on the Earth would be some about one month..??? and again it's very bad conclusion. If the journey would take ten years there would be passed over more that ten thousands of the years and astronaut would reach border line of the galaxy. The possibility to construct such spacecraft is, of course, negligible. If velocity of the spacecraft is approaching speed of light its energy increases heavily. Though this statement must be pronounced by somebody. By whom ? By pilot of the spacecraft or by earthman? Even the planet Earth can be moved by velocity close tospeed of light!! This fact can be observed bu observer from very distant „last“ quasar. Such observer is also looking at us to be moved apart by velocity approaching speed of light and then also our energy was increased to the huge amount of value.

Energy would become infinite at the exact speed of light to be achieved. It is correct at full since Isaac Asimov elaborated principle of journey through the hyper-space, this old way of travelling by approaching speed of light lost its popularity at authors of the science-fiction. Journeys through the hyper-space have no foundation in the present physics but there is an advantage in it that the cosmic agent will not return back to the Earth after plenty of generations will be interchanged here

Is it then possible to explain paradox of twins.in the frame of special theory of relativity ? The answer is yes but with small but.... (see above) [1)]
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