Next Generation Slipstream Interstellar Drive

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A note to the reader/user of this article: however some of the contents in these article may seem true or possible in the (near) future I would like to point out that these are purely fictional.

Should you have any questions concerning this article and the things in it feel free to ask or leave a message, however I cannot guarantee that I will know the answer to every question you might have, I will do my best to answer them.

The **quantum slipstream drive** is an advanced form of interstellar propulsion that achieved and exceeded what failed Federation attempts using transwarp were meant to do: exceed the warp speed barrier. Originally developed by an advanced species native to the Delta Quadrant, the technology was obtained by the USS *Voyager* in 2374 and used for an aborted test in early 2375 (VOY, hope and fear) that nearly destroyed the ship. In 2377 (VOY: Timeless) Voyager brought a newer design, designed by Seven of Nine, online and travelled on slipstream velocity for several hours.

“ quantum slipstream drive, power from the drive is routed through the main deflector dish, creating the slipstream. Analysis shows that it is simular to the transwarpdrive of the borg. “
(Seven of Nine, VOY hope and fear)

The power created by the quantum drive is routed through the main deflector-dish to create a quantum field ahead of the ship, this is resulting in an area that exists outside of normal space and time, known as the slipstream. The field subsequently expands as more power is routed through the deflector, resulting in the engulfment of the ship, enableling it to travel outside of normal space, resulting in a faster means of travel then the ordinary warpdrive.

At the time, the Daystrom institute was hard at work on the Slipstream Development Project, already providing generalized guidelines for the next generation of federation starships as well as being in the midst’s of testing the Generation 0 and Generation 1 Benamite-based Quantum Slipstream Drives. These drives had proven capable of obtaining velocities with the potential of interstellar travel of unfathomably speed first shown during the initial Benamite-based Quantum Slipstream Drive tests done by the Starship Voyager in an attempt to return to federation space in the 2700’s.

The prospect of being able to travel to the delta quadrant in a matter of hours was too, regardless of the energy costs, attractive of a prospect and Starfleet Command approved the Generation 1 engine for official design and development.

In practice, the use of slipstream technology was problematic at best. Although short-lived conduits could be generated relatively easily, a major problem plagued the project: quantum phase variances. During the transit, these variances had a tendency to disrupt the conduit, overloading the quantum bubble and prematurely dropping the starship out of slipstream, with disastrous results. Several successful tests were conducted in 2386, but they were done with vessel sizes no greater than about 16 meters long.

After years of frustrating research, a rather embarrassing breakthrough was made in 2391 when it was discovered that the testing methodology itself was flawed: all of the ships used in prior experiments included warp nacelles, included as part of the matter/antimatter power system as a matter of course. When this seemingly obvious oversight was remedied, several possible theoretical models for successful transit through a slipstream conduit emerged. Soon after, it was realized that a slipstream-capable ship could incorporate warp nacelles if a method to render them energy-neutral was included also, and their z-axis compression was within a very thin tolerance. The race to build a slipstream-capable starship was on.

The Katana class starship is the first Starfleet design specifically built around the quantum phase inversion propulsion technology. Though a relatively small ship, the Katana class frigates should provide a suitable testbed on which to refine slipstream further. Already, though, several drawbacks to this propulsion technology have been identified. First, as stated above, the phase variances of the matrix need to be carefully monitored at all times. Failure to do so could result in the matrix overloading and the vessel dropping out of the conduit unexpectedly. Second, only low energy deflectors may be used during transit: high energy deflectors will disrupt the matrix or prevent its formation entirely.

From an external perspective, slipstream conduits are extremely easy to track, and are quite obvious to even relatively primitive sensors. Therefore, they should not be used near planets settled by low technology civilizations protected by the Prime Directive. Further, the obvious nature of the conduit's formation effectively announces the arrival of a slipstream-capable starship as much as 20 seconds before the starship can exit the conduit. This is a significant tactical disadvantage. Much like transwarp conduits, slipstream conduits can also be disrupted by high-energy explosions across their subspace threshhold or transition path. A ship outside the conduit but in the path of it can therefore bring the slipstream-capable vessel out of the slipstream with a well-placed torpedo blast or use of similar weaponry. If the helm officer's reflexes are not sufficient to the task, a starship caught in such a disruption will certainly be destroyed.

In the years approaching 2402 managed to build a drive that met the Starfleet safety regulations. Initial calculations by the Daystrom institute showed that a ship, using the updated Benamite-based Quantum Slipstream Drive could traverse 10,000 lights years in 15 minutes. However, the stable design developed by Starfleet, used to overcome the quantum fluctuations and field instability encountered by Voyager during her initial tests in the delta quadrant, required huge power reserves to initiate the slipstream field and would require up to twenty-five percent of the matter/anti-matter stores carried by a traditional federation starship. This meant that any ship using the slipstream drive would be capable of long range extended travel, but would require traditional warp-drive for local travel and exploration.

Since the newest starship in design, the Discovery class, was still awaiting completion, Starfleet decided to extend the range of the ships by installing the new slipstream drive, setting new standards for interstellar travel in the future.

If we look at this from the prospect of quantum physics and the theory of general relativity, it would seem possible of people onboard the ship to perceive time normally, while being outside of normal space and time physically. This all depends on the point of reference used. This may seem hard to grasp and I will try to explain this phenomena.

Einstein, in 1905, stated that : The laws of physics are the same in all inertial reference frames, the speed of light in free space has the same value in all inertial reference frames.

The first part of Einstein's postulate states that all physics law always hold, thus the result is that the maximum velocity that can be achieved in inside the slipstream is still the same as everywhere else, warp 9.9985 or the remain closer to reality, the speed of light, c.

So if the maximum speed is the same, then how is it possible to travel faster while in slipstream then when traveling in normal warp. The answer to this problem lies in the concept that time and distance relative as well.
Imagine that we have an observer onboard the ship inside the slipstream(A), and another one in normal space(B). By the first postulate, time progresses the same for the both of them.

*However from A's point of view the time progresses much faster for B then that it does for him. While for B finds that the time of A progresses much slower. This phenomena is called **time dilation**. A similar comparison can be made for the distance traveled, and the observed phenomena is called **length contraction**.*

The best way the picture what happens now is that ,eventhough they both experience a normal trip, from B's point of view A is able to fold space and as a result travel faster. And from A's perspective the time progresses slower for him than it does for B, also resulting in a greater distance traveled in the same time.

These results lead to several other interesting problems, which I will be happy to discuss in person if you want to know more.