Kerbal Space Program - Bug #5387

Shallow low velocity sphere of influence encounter teleportation

09/07/2015 02:13 PM - fibonatic

Status:	Needs Clarification		**Start date:**	09/07/2015
Severity:	Normal		**% Done:**	0%
Assignee:				
Category:	Physics			
Target version:				
Version:	1.0.4		**Language:**	English (US)
Platform:	Windows		**Mod Related:**	No
Expansion:				

Description

I was testing if I had correct expression for the relative velocity when entering a sphere of influence when I encountered this bug. Namely I put a craft in orbit around Kerbin with similar orbital elements as the Mun, with the only difference that its semi-major axis was different, but the difference was smaller that the sphere of influence of the Mun. So this craft will eventually encounter the Mun. When the orbit was higher that that of the Mun the SOI change went as expected, but when the orbit was lower than that of the Mun then the craft was teleported to an entirely different position relative to the Mun. Here is a video demonstration of this:
https://www.youtube.com/watch?v=c3IgSr4IYU0

I also tested it on a few moons around Jool and on Kerbin, while initially in orbit around the sun. It also seems that this teleportation only happens when using time warp (so while on rails), since without time warp or with physics warp then the SOI change goes as suspected.

PS: I have only tested this on a windows computer in KSP 1.0.4

Related issues:

Related to Kerbal Space Program - Bug #5205: Ship on clean Laythe intercept c...		**Updated**	**07/02/2015**

History

#1 - 09/07/2015 11:27 PM - RexKramer

- Status changed from New to Need More Info

Couple of questions.

First, are you able to reproduce this on a stock install?

Also, in the video, what level is your Tracking Station? I ask this because the SOI encounter was not predicted on the map. That would be normal for a level 1 TS (not upgraded), but would be unusual for an upgraded TS. There is another bug where the game is not able to predict SOI encounters under certain conditions, and what you observed could be related to that.

It looks like you had 50X warp, have you noticed the issue occurring at other warp factors?

#2 - 09/08/2015 01:06 AM - fibonatic

I tested this in sandbox mode, so fully upgrades KSC and therefore KSP is indeed also not able to predict the encounter. But I wanted to limit this bug report only to the teleportation.

I also tested this at different timewarp rates, with similar results, so I think it is just due to the facts that the craft is on rails, which causes an incorrect transformation of orbital elements during SOI change.

Tomorrow I will be able to test this again on another computer (will also use a fresh stock install).

#3 - 09/08/2015 04:06 AM - RexKramer

I haven't been able to duplicate in a stock install yet, so please report back if you are able to.

For those interested in testing this, fibonatic's video shows a Kerbin PE 8,972,993 and AP 8,973,244, which is pretty close to the boundary of Mun's SOI.

I managed to get (predicted) intercepts at ~8,971,200. I did see some strange behavior when my orbit was nearly circular, including constantly increasing AP while sitting still at PE and not on rails. I attribute this to rounding issues, which are known to exist in the game.

A few more questions to clarify-

1. Did you observe the teleportation effect in the vicinity of other bodies, or just Mun?
2. Have you observed the effect when your orbit is outside the Mun's (or other body), or only when your orbit is inside the Mun's as depicted in your video?

Finally, your output_log.txt file (player.log on OSX) may be helpful. A good time to grab that would be shortly after a teleportation event. Instructions on locating your output_log.txt file can be found here: http://bugs.kerbalspaceprogram.com/projects/ksp/wiki Guide

#4 - 09/08/2015 04:21 AM - RexKramer

- Related to Bug #5205: Ship on clean Laythe intercept crashes to Tylo added

#5 - 09/08/2015 11:42 AM - rudi1291

- File quicksave.sfs added

I tested it on a stock linux install and was unable to reproduce this. I was orbiting inside the muns orbit arround kerbin without predicted intercept like fibonatic and the mun captured me. The attached quicksave was made just before the encounter.

#6 - 09/22/2015 09:58 PM - Kasuha

- File screenshot175.png added

- File screenshot176.png added

- File screenshot177.png added

I tested it in stock and experienced no teleportation. After loading the quicksave, I had to time warp for about 8 minutes - things started happening at 34d, 01:08:30 MET.

First the ship entered the "nowhereland" where the game is undecided whether the ship is inside or outside the SOI - that can be almost always observed when exiting the SOI, this is the first time I saw it when entering.

Then the ship entered "normal" orbit inside the SOI.

Of course that "nowhereland" is a bug (unrelated to #5205 & comp.). The ship is affected by gravity as if it is inside the SOI, its orbit is calculated as if it is inside the SOI but only the orbit's part outside the SOI is drawn, followed by SOI entry. Also navball is oriented as if the ship is not inside the SOI.

I also believe the fact that the SOI intersection is not visible is not related to #5205, it is a separate bug. In #5205 the trajectory makes deep cut into the SOI, there is no dispute whether it intersects it or not. In this case the trajectory is barely touching the SOI and it is possible that it does not actually intersect it - but the part of the code that evaluates distance from Mun decides it is close enough and forces SOI switch. The "nowhereland" might be caused by that - one evaluation method says the ship is inside the SOI, the other says it is outside.

#7 - 07/17/2016 09:39 AM - TriggerAu

- Status changed from Need More Info to Needs Clarification

Files

quicksave.sfs	50.6 KB	09/08/2015	rudi1291
screenshot175.png	301 KB	09/22/2015	Kasuha
screenshot176.png	328 KB	09/22/2015	Kasuha
screenshot177.png	307 KB	09/22/2015	Kasuha