GR 10: Experimental tests I

Zeit: Donnerstag 11:45–12:30 Raum: NW-Bau - HS3

Hauptvortrag GR 10.1 Do 11:45 NW-Bau - HS3

A test of the gravitational redshift using Galileo satellites 5 and 6 — •Sven Herrmann, Felix Finke, Olga Kichakova, Claus Lämmerzahl, Meike List, and Benny Rievers — ZARM, Center of Applied Space Technology and Microgravity, University Bremen

The European GNSS satellites Galileo 5 and 6 launched in August 2014 have not reached their targeted circular orbit at around 22.000 km height. Instead, their orbits now possess an eccentricity of about 0.16 and the satellites' height changes periodically about 8000 km during each orbit. While this is of some disadvantage for navigation purposes it offers a unique possibility to perform a precise test of the gravitational redshift predicted by General Relativity. Thus, with support from DLR (RELAGAL project) and ESA (GREAT project), we have conducted an analysis of the clock and orbit data from these two satellites to investigate whether an improved test over the result from Vessot and Levines GPA experiment can be obtained. Here we present the results of this analysis covering approximately 3 years of data and give an outlook on further possible improvements of this test.