Project 2 in FYS3150

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https://github.com/UlrikSeip/Projects/tree/master/prosjekt3

1 ABSTRACT

2 INTRODUCTION

When simulating orbits for several celestial bodies with high accuracy, the computation can be expensive, and so it is paramount to strike a balance between efficiency and accuracy. To explore this balance, we run simulations using the Velocity-Verlet integration method, and comparing with the Forward-Euler method. Having found the optimal way to simulate the orbits, we move on to

3 METHOD

3.a a

The gravitational force on Earth from the Sun is

$$F_G = \frac{M_{\text{Earth}} v^2}{r} = \frac{G M_\odot M_{\text{Earth}}}{r^2} = \frac{M_{\text{Earth}} 4\pi^2}{r^2} \text{AU}^3/\text{yr}^2, \tag{1}$$

wich gives the acceleration

$$f^{(2)}(r) = \frac{M_{\text{Earth}} 4\pi^2}{r^2} \text{AU}^3/\text{yr}^2.$$

4 RESULTS

5 CONCLUSIONS

6 APENDICES

7 REFERENCES

References

[1] Computational Physics, Lecture Notes Fall 2015, Morten Hjort-Jensen p.215-220