Calculations within Unified field

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Analysis of two-body four-force systems of celestial bodies

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A Frenchman who arrives in London, will find philosophy, like everything else, very much changed there. He had left the world a plenum, and he now finds it a vacuum. At Paris the universe is seen composed of vortices of subtile matter; but nothing like it is seen in London. In France, it is the pressure of the moon that causes the tides; but in England it is the sea that gravitates towards the moon... You will observe farther, that the sun, which in France is said to have nothing to do in the affair, comes in here for very near a quarter of its assistance. According to your Cartesians, everything is performed by an impulsion, of which we have very little notion; and according to Sir Isaac Newton, it is by an attraction, the cause of which is as much unknown to us...

Voltaire, *Letters on Descartes and Newton*, c. 1778

Position of Hilbert in 1915 in this question has been not much better. As Ebner (2006) deciphers, guess of Hilbert was

$$\mathbf{H = K + L}$$

***"H** is the Lagrangian, which by (5a) is the sum of the Lagrangian **K** of the gravitational field and the Lagrangian **L** of everything else (matter, radiation)".*
We read further in Ebner, that Langranian **L** corresponds to electromagnetic density.

As simple "two body problems", which are governed only by gravity and electromagnetism were not known at this time, Hilbert, Einstein and partners were foredoomed to infertile theorizing. Curved space somewhat reminds gravitation vortices, popular in 17th century. Theoretic celestial mechanics nowadays try to operate with iconic "universal gravitation" only (Morbidelli, 2011). Gravitation for them is responsible for attraction, tidal interaction and circular motion of planets. Sometimes this gravitation acts as inverse square law of distance, sometimes- as inverse cube, and sometimes- with variable force. Thus "tidal forces" for satellite industry has been approximated as

$$F = \frac{2GMmr}{R^3}$$

were **M** and **m**- masses, **G**- constant, **r**- radius of the satellite, **R**- centre-centre distance. Discrepancy of celestial events with theory is called simply "non-gravitational perturbations"

(cf. Mathis). Needless to say, we have celestial mechanics as mainly mathematics still (cf.Hegel, 1801).

Insight of Mathis (2010), that both fields, which possess physical body, can be separated from "unified field equations" and analyzed as real forces, finally allows us to move further. Two body- four force systems in a spirit of Hilbert have been known for more than twenty years. Those are 1) asteroid-moon systems and 2) star- exoplanet systems with around 90 degrees inclined and narrow orbits. In such a systems, orbital distances in stable orbits are governed by gravitation and "charge field" only. Symptomatic, that here are not around 90 degrees inclined orbits of Jovian planet satellites.

Mathis proposed, that, for analysis of Unified field, volume of celestial body, so to speak, should be separated from its density. Gravity is connected with volume, "charge field"- with density (mass). Volume of celestial body is disturbing hypothetic ether in vicinity, causing "gravity" (simplified) in **V/A** mode (**V**- volume, cubic meters, **A**- orbital distance, meters). Physical mass of celestial body emits kind of electromagnetism, acting in $\mathbf{1/A^3}$ mode. Both concepts can be traced back to Newton (Alksnis, 2018).

Let us check usefulness of our guess by analysis of orbital distances of two body-four force systems (table 1). "Gravity" here is expressed as **V/A** force, and "charge field"- as $\mathbf{B*M*0.5S/A^3}$ were **B**- coefficient, **M**- central mass, kg, **S**- surface area of secondary, square meter, **A**- orbital distance, meters**.**

Primary	Mass M, kg	Volume V, m^3	Secon-dary	1/2 surface S, m^2	Orbital distance A, m	$B*M*0.5S/A^3$	V/A
7369 Gavrilin	2.71E+09	2.25E+11		9.12E+06	2.78E+04	B*2.87E+05	8.08E+06
90 Antiope	6.75E+11	3.54E+14	**S/2000 (90)**	1.11E+10	1.71E+05	B*9.20E+11	2.07E+09
216 Cleopatra*	4.15E+17	1.29E+15	**Alexhe-lios**	1.24E+08	6.78E+05	B*1.60E+09	1.90E+09
216 Cleopatra*	4.15E+17	1.29E+15	**Cleo-selene**	7.48E+07	4.54E+05	B*3.20E+09	2.84E+09
283 Emma	4.00E+18	1.91E+15		1.27E+08	5.81E+05	B*8.95E+08	3.29E+09
45 Eugenia	1.38E+18	6.47E+14	**Petit prince**	2.65E+08	1.18E+06	B*9.29E+08	5.48E+08
Mars	5.75E+18	1.62E+20	**Deimos**	5.66E+07	2.35E+07	B*2.80E+09	6.88E+12
Earth	6.42E+23	1.08E+21	**Moon**	1.90E+13	3.84E+08	B*2.00E+12	2.82E+12
Gliese 436	5.97E+24	1.04E+26	**b**	4.79E+15	4.36E+09	B*4.71E+16	2.39E+16
Kepler-78*	8.16E+29	5.72E+26	**b**	3.51E+14	1.33E+09	B*2.22E+17	4.30E+17
HAT-P-11	1.49E+30	4.49E+26	**b**	5.36E+15	7.95E+09	B*1.72E+16	5.65E+16
COROT-7	1.61E+30	7.80E+26	**b**	6.41E+14	2.58E+09	B*6.76E+16	3.02E+17
55 Cancri	1.81E+30	2.16E+27	**e**	1.01E+15	2.34E+09	B*1.49E+17	9.24E+17
WASP-19	1.89E+30	1.13E+27	**b**	6.03E+16	2.44E+09	B*7.83E+18	4.65E+17
WASP-47	1.89E+30	2.20E+27	**e**	8.46E+14	2.59E+09	B*1.07E+17	8.50E+17
WASP-47	2.21E+30	2.20E+27	**b**	4.25E+16	7.80E+09	B*1.97E+17	2.82E+17
WASP-18	2.21E+30	1.99E+28	**b**	3.72E+16	3.00E+09	B*3.44E+18	6.62E+18

Table 1. Proportional calculations. *- assumed mass

By comparision of our hypothetic forces in last two columns it is clear, that 1)generally concept seems to be working and 2) B likely is 1, what is surprising.

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