REMARKS ON SOME CLASSICAL PROBLEMS OF CELESTIAL MECHANICS (ABSTRACT)

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Several problems not yet solved arise when expansions of the disturbing function are considered. Main troubles are due to the large number of terms of the periodic developments. Such difficulties lead to search the representation of a very great amount of terms with small amplitudes, by means of closed expressions. Balance should be performed between the amount of the arithmetic errors introduced by the consideration of the full original developments and the errors due to the chosen approximate representations. It is also interesting to point out that developments are strongly shortened when true (or eccentric) anomaly is used as independent variable. This statement implies a change in the setting of the solution of the classical three-body problem. Moreover, it is observed, that usual formulae which give the errors of the elementary arithmetic operations may not be valid in view of the presence of a "range of ambiguity", owing to the particular structure of the developments which represent the solutions of the disturbed problem, in the sense that many coefficients of the periodic terms are compatible with observable quantities, i.e. the accuracy of the orbital elements, despite that their "components" may not satisfy this condition. Special theories must be then developed to cover the several fields of the problem, some of which are in progress at present.