75.1. Dynamics of Artificial Satellites around Europa
[http://www.hindawi.com/journals/mpe/2013/182079/](http://www.google.com/url?q=http%3A%2F%2Fwww.hindawi.com%2Fjournals%2Fmpe%2F2013%2F182079%2F&sa=D&sntz=1&usg=AFQjCNFJsCondM15y0l2QEZeQY6GKzE5pQ)

Mathematical Problems in EngineeringVolume 2013 (2013), Article ID
182079, 7 pageshttp://[dx.doi.org/10.1155/2013/182079](http://www.google.com/url?q=http%3A%2F%2Fdx.doi.org%2F10.1155%2F2013%2F182079&sa=D&sntz=1&usg=AFQjCNFhv55iv7re_w8RN4Aw3dSjqPPRoA)

Research Article

Dynamics of Artificial Satellites around Europa
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access article distributed under the Creative Commons Attribution
License, which permits unrestricted use, distribution, and
reproduction in any medium, provided the original work is properly
cited.
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80.2. Nonlinear Dynamic Equations of Satellite Relative Motion Around
an Oblate Earth
[http://www.researchgate.net/publication/245433512\_Nonlinear\_Dynamic\_Equations\_of\_Satellite\_Relative\_Motion\_Around\_an\_Oblate\_Earth](http://www.google.com/url?q=http%3A%2F%2Fwww.researchgate.net%2Fpublication%2F245433512_Nonlinear_Dynamic_Equations_of_Satellite_Relative_Motion_Around_an_Oblate_Earth&sa=D&sntz=1&usg=AFQjCNHUlUoXcGT55BqBXfeCt7kVmPJpFQ)

                "Studying the optimal rendezvous problem, Park et al. (2006) derived
nonlinear dynamics of relative motion in series form with respect to a
circular reference orbit. Since the Earth's oblateness causes one of
the most dominant perturbations in orbital environments, some studies
have tried to include its effect using the second zonal harmonic (J 2
) of the gravitational field (Kechichian, 1998; Schweighart and
Sedwick, 2002; Humi and Carter, 2008; Xu and Wang, 2008). "
Article: Spacecraft fuel-optimal and balancing maneuvers for a class
of formation reconfiguration problems
Sung-Moon Yoo · Sangjin Lee · Chandeok Park · Sang-Young Park
[Show abstract]
Advances in Space Research 10/2013; 52(8):1476-1488.
DOI:10.1016/j.asr.2013.07.019 · 1.35 Impact Factor

50.3. Optimizing the Satellite Control Gains with Nonlinear Motion
Equations using SQP Method

[http://research.ijcaonline.org/volume118/number22/pxc3903626.pdf](http://www.google.com/url?q=http%3A%2F%2Fresearch.ijcaonline.org%2Fvolume118%2Fnumber22%2Fpxc3903626.pdf&sa=D&sntz=1&usg=AFQjCNHa_85wSCmthDvverMCOLIvXcFmLw)

International Journal of Computer Applications (0975 – 8887) Volume
118 – No.22, May 2015

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50.4.
Survey of State-Dependent Riccati Equation in Nonlinear Optimal
Feedback Control Synthesis

60.5. A Block Procedure with Linear Multi-Step Methods Using Legendre
Polynomials for Solving ODEs

[http://www.scirp.org/journal/PaperInformation.aspx?PaperID=56023](http://www.google.com/url?q=http%3A%2F%2Fwww.scirp.org%2Fjournal%2FPaperInformation.aspx%3FPaperID%3D56023&sa=D&sntz=1&usg=AFQjCNEZe9XzXa2_6P0nhr8QiX4fWf1Ogg)

ABSTRACT
In this article, we derive a block procedure for some K-step linear
multi-step methods (for K = 1, 2 and 3), using Legendre polynomials as
the basis functions. We give discrete methods used in block and
implement it for solving the non-stiff initial value problems, being
the continuous interpolant derived and collocated at grid and off-grid
points. Numerical examples of ordinary differential equations (ODEs)
are solved using the proposed methods to show the validity and the
accuracy of the introduced algorithms. A comparison with fourth-order
Runge-Kutta method is given. The ob-tained numerical results reveal
that the proposed method is efficient.
KEYWORDS
Collocation Methods with Legendre Polynomials, Initial Value Problems,
Perturbation Function, Fourth-Order Runge-Kutta Method
Cite this paper
Abualnaja, K. (2015) A Block Procedure with Linear Multi-Step Methods
Using Legendre Polynomials for Solving ODEs. Applied Mathematics, 6,
717-723. doi: 10.4236/am.2015.64067.

45.6. Legendre Polynomials Iterative Technique for Solving a Class of
Nonlinear Optimal Control Problems

[http://www.sersc.org/journals/IJCA/vol7\_no3/3.pdf](http://www.google.com/url?q=http%3A%2F%2Fwww.sersc.org%2Fjournals%2FIJCA%2Fvol7_no3%2F3.pdf&sa=D&sntz=1&usg=AFQjCNHDd0yUoWvNc_ueAvCdRru8lAJptQ)

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[jaddu@eng.alquds.edu](https://mail.google.com/mail/u/0/h/vg9o7yihe2hv/?&cs=wh&v=b&to=jaddu@eng.alquds.edu), [amjadmajdalawi@hotmail.com](https://mail.google.com/mail/u/0/h/vg9o7yihe2hv/?&cs=wh&v=b&to=amjadmajdalawi@hotmail.com)
Abstract
A computational algorithm is proposed to solve a class of nonlinear
optimal control problems. The proposed algorithm is based on replacing
the original nonlinear optimal control problem by a sequence of
time-varying linear quadratic optimal control problems. This is
accomplished by employing an iterative technique developed by Banks
[1-5] which is based on replacing the original nonlinear system by a
sequence of linear time-varying systems. Then each of the time-varying
linear quadratic optimal control problems is transformed into a
standard quadratic programming problem by parameterizing the state
variables by a finite length Legendre polynomials with unknown
parameters. The solution of a standard nonlinear optimal control
problem is presented, to show the effectiveness of the proposed
method.
Keywords: Nonlinear optimal control problem, Banks Iterative
Technique, Legendre polynomials, State parameterization

50.7. Nonlinear Orbital Dynamic Equations and State- Dependent Riccati
Equation Control of Formation Flying Satellites1

[http://www.temple.edu/csnap/publications/jas2003.pdf](http://www.google.com/url?q=http%3A%2F%2Fwww.temple.edu%2Fcsnap%2Fpublications%2Fjas2003.pdf&sa=D&sntz=1&usg=AFQjCNE2njDrZTgmqwiJ89aqwFWxTvpQ1Q)

Nonlinear Orbital Dynamic Equations and State- Dependent Riccati
Equation Control of Formation Flying Satellites1
Abstract
Chang-Hee Won and Hyo-Sung Ahn
Department of Electrical Engineering University of North Dakota
15 July 2004

60.8. Translation Dynamical Nonlinear Models in Perturbed Keplerian
Conditions For a Geostationary Satellite

[http://www.sersc.org/journals/IJHIT/vol8\_no1\_2015/37.pdf](http://www.google.com/url?q=http%3A%2F%2Fwww.sersc.org%2Fjournals%2FIJHIT%2Fvol8_no1_2015%2F37.pdf&sa=D&sntz=1&usg=AFQjCNGQcaPAFWRbtfuPGTEkQh9woy3c5A)
International Journal of Hybrid Information Technology Vol.8, No.1
(2015), pp.417-426 [http://dx.doi.org/10.14257/ijhit.2015.8.1.37](http://www.google.com/url?q=http%3A%2F%2Fdx.doi.org%2F10.14257%2Fijhit.2015.8.1.37&sa=D&sntz=1&usg=AFQjCNHUuK_6YaubXEpvAyPTuHRruev36Q)

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[1Louardi\_b@yahoo.fr](https://mail.google.com/mail/u/0/h/vg9o7yihe2hv/?&cs=wh&v=b&to=1Louardi_b@yahoo.fr), [2dj\_benatia@yahoo.fr](https://mail.google.com/mail/u/0/h/vg9o7yihe2hv/?&cs=wh&v=b&to=2dj_benatia@yahoo.fr)
Abstract
The dynamics of a GEO satellite will be studied in this work to obtain
a dynamical model as accurate as possible. This model will be obtained
in terms of Gauss’ variation of osculating parameter (VOP) equations
containing the environmental perturbing accelerations, which are
traditionally used to plan the station keeping maneuvers. The idea is
to implement a controller for geostationary station keeping purposes
based on a model written in terms of osculating orbital elements
instead of averaged elements. Such a controller plans in an automatic
way the station keeping (SK) maneuvers and it could be integrated on
board in view of autonomous station keeping control loop.
Keywords: classical orbital elements COE, equinoctial orbital elements
EOE, environmental forces acting, perturbing accelerations,variation
of parameter (VOP).

55. 9. A set of r dynamical attitude equations for an arbitrary n-body
satellite having r rotational degrees of freedom
[http://arc.aiaa.org/doi/abs/10.2514/3.5873](http://www.google.com/url?q=http%3A%2F%2Farc.aiaa.org%2Fdoi%2Fabs%2F10.2514%2F3.5873&sa=D&sntz=1&usg=AFQjCNEe6wMtFWW4hDZ3_49rvd2UZ54BFw)

68.10. Nonlinear dynamics and station-keeping control of a rotating
tethered satellite system in halo orbits

[http://www.sciencedirect.com/science/article/pii/S1000936113001702](http://www.google.com/url?q=http%3A%2F%2Fwww.sciencedirect.com%2Fscience%2Farticle%2Fpii%2FS1000936113001702&sa=D&sntz=1&usg=AFQjCNGFtq0YCz055hi8jKWTekR4G8G6Jw)

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