

Author: **Assoc. Prof. dr. ITU CĂLIN**

Habilitation thesis title: **Virtual modeling and simulations on metal and composite structures in the field of mechanical engineering**

Domain: **Mechanical Engineering**

## **PUBLICATIONS LIST**

### **RELEVANT PAPERS**

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1. **Calin Itu**, Polidor Bratu, Paul Nicolae Borza, Sorin Vlase, Dorin Lixandroiu - Design and Analysis of Inertial Platform Insulation of the ELI-NP Project of Laser and Gamma Beam Systems, SYMMETRY-BASEL, Vol.12, 2021, FI = 2,645
2. **Călin ITU**, Maria Luminița Scutaru, Cătălin Iulian Pruncu, Radu Muntean - Kinematic and Dynamic Response of a Novel Engine Mechanism Design Driven by an Oscillation Arm, Applied Sciences 10(8), 2733, 2020, FI = 2,474
3. Mihaela Violeta Munteanu, Mircea Mihălcică, **Călin Itu**, Sorin Vlase, and Maria Luminita Scutaru - Mechanical design of interaction chamber for the ELIADE array at ELI-NP, AIP Advances 10, FEB 2020, FI = 1,627
4. **Itu, C.**; Cerbu, C.; Gălățanu, T.-F. - Modeling and Testing of the Sandwich Composite Manhole Cover Designed for Pedestrian Networks, MATERIALS 12, 1114, ISSN:1996-1944, APR 2019, FI = 3,424
5. **Calin ITU**, Andreas Ochsner, Sorin Vlase and Marin I Marin, Improved rigidity of composite circular plates through radial ribs, Proceedings of the Institution of Mechanical Engineers Part I - Journal of Materials and Design ISSN:1464-4207, eISSN: 2041-3076, SAGE Journal, 2018, FI = 2,014
6. Vlase, S.; Teodorescu, P. P.; **Itu, C.**; Scutaru, M. L. - Elasto-Dynamics of a Solid with a General "Rigid" Motion using FEM model. PART II. Analysis of a Double cardan joint, ROMANIAN JOURNAL OF PHYSICS, 58 (7-8), 2013, FI = 1,197
7. Vlase, S., **Itu, C.**, Vasile, O., Năstac, C., Stanciu, M. and Scutaru, M. - Vibration Analysis of a Mechanical System Composed of Two Identical Parts. Romanian Journal of Acoustics and Vibration. 15, 1 (Aug. 2018), 58-63.

8. **Itu Călin**, Scutaru Maria Luminița, Modrea Arina, Hebert Hektor, Bending behavior of a circular composite panels used in civil engineering, in Proceeding of the 12<sup>th</sup> International Conference Interdisciplinarity in Engineering, INTER-ENG 2018, Tîrgu Mureș 04 – 05 Oct 2018, ISSN: 2351-9789, Vol. 32, pp. 151 – 160

9. **Calin ITU**, Sorin VLASE, Maria Luminita SCUTARU, Consuella Sofia PENA, Paul Nicolae BORZA, Mircea MIHĂLCICĂ, Universal absorber applied to NVH in EV's powertrain, Acoustics and Vibration of Mechanical Structures – AVMS 2017, Proceedings of the 14th AVMS Conference Timișoara, România, May 25-26, 2017

10. Mirela Coman, Ioan Curtu, **Călin Itu**, Mariana Domnica Stanciu, Analysis of joints and ornaments of the wooden churches structures in Maramureș county, pp. 553 – 560 PRO LIGNO, Volume 11, Number 4, 2015

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#### **PhD THESIS**

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CONTRIBUȚII PRIVIND ÎMBUNĂTĂȚIREA PLĂCILOR CIRCULARE REALIZATE DIN MATERIALE COMPOZITE STRATIFICATE

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#### **BOOKS / BOOKS CHAPTERS**

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1. GH. N. RADU, FL. S. DOGARU, **C. ITU**, REZISTENȚA MATERIALELOR – CULEGERE DE PROBLEME, vol.2 – 2005, Editura LUX LIBRIS, ISBN 973-9458-52-1

2. **Călin ITU**, CONTRIBUȚII PRIVIND ÎMBUNĂTĂȚIREA PLĂCILOR CIRCULARE REALIZATE DIN MATERIALE COMPOZITE STRATIFICATE – Teză de doctorat, Editura Universității Transilvania BRAȘOV, 2014

3. **Călin ITU**, CURS – REZISTENȚA MATERIALELOR ÎN INGINERIA MECANICĂ, Editura Universității Transilvania BRAȘOV, 2019, ISBN 978-606-19-1114-1

4. **Călin ITU**, MATERIALE COMPOZITE STRATIFICATE, Editura Universității Transilvania BRAȘOV, 2016, ISBN 978-606-19-0848-6

5. **Călin ITU**, ÎNDRUMAR SEMINAR – REZISTENȚA MATERIALELOR, PARTEA I, Editura Universității Transilvania BRAȘOV, 2018, ISBN 978-606-19-1022-9,

6. **Călin ITU**, ÎNDRUMAR SEMINAR – REZISTENȚA MATERIALELOR, PARTEA II, Editura Universității Transilvania BRAȘOV, 2019, ISBN 978-606-19-1144-8.

7. **Călin ITU**, MODELAREA ȘI CALCULUL DINAMIC AL SISTEMELOR MULTICORP ÎN INGINERIA MECANICĂ – Monografie, Editura Universității Transilvania BRAȘOV, 2021, ISBN 978-606-19-1359-6

### **JOURNAL ARTICLES**

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1. STANCIU Mariana, CURTU I, **ITU C**, Grimberg R, Analiza dinamica prin metoda elementelor finite a placilor acustice din componenta chitarei, PROLigno (CNCSIS cu codul 746 B+, indexata in BDI Academic Search Complete-EBSCO Publishing Ltd USA), vol. 4, Nr. 1-2008 (martie), p. 41-54, ISSN 1841-4737

2. Curtu I, Stanciu Mariana Domnica, **ITU C**, Savin Adriana, Aspects Regarding to the Frequency Response of the Acoustic Plates with Finite Element Method, BULETINUL INSTITUTULUI POLITEHNIC DIN IASI. PUBLICAT DE UNIVERSITATEA TEHNICA GH. ASACHI IAȘI. SECȚIA CONSTRUCȚII DE MAȘINI, 2008

3. Stanciu M, Curtu I, **itu C**, Influenta geometriei si a proprietatilor fizico-mecanice si elastice ale materialelor lignocelulozice asupra frecvențelor proprii ale plăcilor de chitară utilizând FEM, Buletinul AGIR nr. 1/2009

4. CERBU, Camelia; **ITU, Călin**; CURTU Ioan, The problem of the using of the composite materials reinforced with glass fibres to manufacturing of some components of the garden chairs, Journal ProLigno, vol. 6, Nr. 3, Sep 2010, ISSN 1841-4737, pp. 51-60

5. S. VLASE, P.P. TEODORESCU, **C. ITU**, M.L.SCUTARU, Elasto-Dynamics of a Solid with a General "Rigid" Motion Using FEM Model. Part II. Analysis of a Double Cardan Joint, pp.882-893 Romanian Journal of Physics, Volume 58, Number 7-8, 2013

6. Mirela Coman, Ioan Curtu, **Călin Itu**, Mariana Domnica Stanciu, Analysis of joints and ornaments of the wooden churches structures in Maramureș county, pp. 553 – 560 PRO LIGNO, Volume 11, Number 4, 2015

7. **Călin Itu**, Maria Luminița Scutaru, Research regarding damage detection in the inertial dampers of the electric vehicle, Proceedings of the 6th International Conference "Computational Mechanics and Virtual Engineering", COMEC 2015 (DERC Publishing House, USA), 15 – 16 Oct, Brașov, România, pp. 295 – 302, ISSN-13: 978-1-939757319
8. Vlase, S., **Itu, C.**, Vasile, O., Năstac, C., Stanciu, M. and Scutaru, M. - Vibration Analysis of a Mechanical System Composed of Two Identical Parts. Romanian Journal of Acoustics and Vibration, Volume 15, Number 1, Aug. 2018, pp. 58-63, ISSN 1584-7284, eISSN: 2602-0351
9. **Calin Itu**, Polidor Bratu, Paul Nicolae Borza, Sorin Vlase, Dorin Lixandroi - Design and Analysis of Inertial Platform Insulation of the ELI-NP Project of Laser and Gamma Beam Systems, SYMMETRY-BASEL, Vol.12, 2021, FI = 2,645
10. **Călin ITU**, Maria Luminița Scutaru, Cătălin Iulian Pruncu, Radu Muntean - Kinematic and Dynamic Response of a Novel Engine Mechanism Design Driven by an Oscillation Arm, Applied Sciences 10(8), 2733, 2020, FI = 2,474
11. Mihaela Violeta Munteanu, Mircea Mihălcică, **Călin Itu**, Sorin Vlase, and Maria Luminita Scutaru - Mechanical design of interaction chamber for the ELIADE array at ELI-NP, AIP Advances 10, FEB 2020, FI = 1,627
12. **Itu, C.**; Cerbu, C.; Gălățanu, T.-F. - Modeling and Testing of the Sandwich Composite Manhole Cover Designed for Pedestrian Networks, MATERIALS 12, 1114, ISSN:1996-1944, APR 2019, FI = 3,424
13. **Calin ITU**, Andreas Ochsner, Sorin Vlase and Marin I Marin, Improved rigidity of composite circular plates through radial ribs, Proceedings of the Institution of Mechanical Engineers Part I - Journal of Materials and Design ISSN:1464-4207, eISSN: 2041-3076, SAGE Journal, 2018, FI = 2,014
14. Vlase, S.; Teodorescu, P. P.; **Itu, C.**; Scutaru, M. L. - Elasto-Dynamics of a Solid with a General "Rigid" Motion using FEM model. PART II. Analysis of a Double cardan joint, ROMANIAN JOURNAL OF PHYSICS, 58 (7-8), 2013, FI = 1,197
15. Vlase, S., **Itu, C.**, Vasile, O., Năstac, C., Stanciu, M. and Scutaru, M. - Vibration Analysis of a Mechanical System Composed of Two Identical Parts. Romanian Journal of Acoustics and Vibration. 15, 1 (Aug. 2018), 58-63.

16. **Calin ITU**, Sorin VLASE, Maria Luminita SCUTARU, Consuella Sofia PENA, Paul Nicolae BORZA, Mircea MIHĂLCICĂ, Universal absorber applied to NVH in EV's powertrain, Acoustics and Vibration of Mechanical Structures – AVMS 2017, Proceedings of the 14th AVMS Conference Timișoara, România, May 25-26, 2017

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#### **PAPERS IN INTERNATIONAL CONFERENCES**

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1. Curtu I., **Itu. C.**, Nastac S., Stanciu M.D., On Dynamic Characterization of Flexible Structures Due to Impulsive Actions, in Proceeding of the 10<sup>th</sup> Biennial International Conference in Vibration Problems, ICOVP 2011, Praga 05-08 septembrie 2011, ISBN 978-80-7372-759-8, pp. 255-260, WOS:000393361600038

2. Stanciu M.D., Curtu I., **Itu C.**, Nastac S., Timar I., On Static and Dynamic Behavior of Noise Barriers Structures using FEA, in Proceeding of the 10<sup>th</sup> Biennial International Conference in Vibration Problems, ICOVP 2011, Praga 05-08 septembrie 2011, ISBN 978-80-7372-759-8, pp. 491-496, WOS:000393361600076

3. **Itu Călin**, Vlase Sorin, Scutaru Maria Luminița, Modrea Arina, Bending behavior of a high rigidity plate made by a composite panel, in Proceeding of the 12<sup>th</sup> International Conference Interdisciplinarity in Engineering, INTER-ENG 2018, Tîrgu Mureș 04 – 05 Oct 2018, ISSN: 2351-9789, Vol. 32, pp. 144 – 150, WOS:000471295800021

4. **Itu Călin**, Scutaru Maria Luminița, Modrea Arina, Hebert Hektor, Bending behavior of a circular composite panels used in civil engineering, in Proceeding of the 12<sup>th</sup> International Conference Interdisciplinarity in Engineering, INTER-ENG 2018, Tîrgu Mureș 04 – 05 Oct 2018, ISSN: 2351-9789, Vol. 32, pp. 151 – 160, WOS: 000471295800022

5. **Itu, C.**; Scutaru, M.L.; Modrea, A.; Mihalcica, M. - Traction characteristics for the components of a composite sandwich used to build high-rigidity circular plates, in Proceeding of the 12<sup>th</sup> International Conference Interdisciplinarity in engineering, Inter-Eng 2018, Tîrgu Mureș 04 – 05 Oct 2018, ISSN: 2351-9789, Vol. 32, pp. 268 – 277, WOS: 000471295800022

6. Scutaru, M.L.; **Itu, C.**; Marin, M.; Grif, HS - Bending Tests Used to Determine the Mechanical Properties of the Components of a Composite Sandwich Used in Civil Engineering, in Proceeding of the 12<sup>th</sup> International Conference Interdisciplinarity in

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7. Scarlatescu, Dumitru Daniel, **Itu Călin**, Modre Arina, Hebert Hektor, Stresses in a Water Supply Network's Elbow in Case of Burial in Ground and Anchorage in Concrete, in Proceeding of the 13<sup>th</sup> International Conference Interdisciplinarity in engineering, Inter-Eng 2019, Tîrgu Mureş 03 – 04 Oct 2019, ISSN: 2351-9789, Vol. 46, pp. 70 – 77, WOS: 000582466200011

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10. Stanciu, M.; Curtu, I.; **Itu, C.**, Influence of the strengthening bars of guitar's plates on the normal modes of vibrations using finite element method, in Proceeding of the 19<sup>th</sup> International Symposium of the Danube Adria Association for Automation and Manufacturing, Trnava, SLOVAKIA 2008, 22 – 25 Oct, pp. 1295 – 1296, ISBN:978-3-901509-68-1, ISSN: 1726-9679, WOS: 000262860100647

11. Curtu, I.; Stanciu, M.D.; **Itu, C.**; Grimberg, R, Numerical modelling of the acoustic plates as constituents of stringed instruments, in Proceeding of the 6<sup>th</sup> International Conference of Daaam Baltic Industrial Engineering, DAAAM Int Vienna, Tallinn, ESTONIA, 24 – 26 apr, 2008, ISBN:978-9-985-59783-5, WOS: 000257464400008

12. **Călin ITU**, Analysis for some constructive parameters of the engine with turning arm comparison by conventional engine with internal combustion, in Proceeding of 5<sup>th</sup>

International Conference TEHNONAV 2006, Constanța, ROMANIA, 19 – 21 Mai, Vol VIII, pp. 473 – 475, ISSN 1223-7221

13. **C. Itu**, F. Dogaru, M. Baba., Dynamic con-rod analysis for different type of materials based on virtual simulation., in Proceeding of the International Conference on Materials Science and Engineering BRAMAT 2007, 22 – 24 February 2007, Brasov, Romania, ISSN 1223 – 9631

14. M. Baba, **C. Itu**, F. Dogaru., Micromechanics aspects about the prediction of elastic properties for a lignocellulosic composite lamina., in Proceeding of the International Conference on Materials Science and Engineering BRAMAT 2007, 22 – 24 February, Brasov, Romania, ISSN 1223 – 9631

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16. **Călin Itu**, A possible design solution of the engine for minimize consumption and reduction pollution, in Proceeding of the 2<sup>nd</sup> International Conference „Advanced Composite Materials Engineering”, COMAT 2008, 9 – 11 Oct, Vol. 1.A, pp. 145 – 148, Brașov, România, ISSN: 1844 – 9336

17. Stanciu Mariana D, Curtu I, **Itu C.**, Savin Adriana, Researches concerning to the free and forced vibrations of the acoustic ligno-cellulose plates, in Proceeding of 12<sup>th</sup> International Research/Expert Conference “Trends in the Development of Machinery and Associated Technology” TMT 2008, Istanbul-Turcia, 26 – 30 Aug, ISSN: 1840-4944, pp. 957 – 960

18. Curtu I., Stanciu M.D., **Itu C.**, Savin A., Rosu D., Research regarding structural optimization of classical guitar body, Proc. of The 7th Edition of International Conference „Wood Science and Engineering in the Third Millennium”, ICWSE 2009, 4-6 June 2009, Brasov, România, ISSN 1843-2689, pp. 654-662

19. Stanciu Mariana Domnica, Curtu Ioan, Cosoreanu Camelia, **Itu Călin**, Rusu Sebastian, Năstac Silviu, New concept about stiffness of guitar soundboard based on golden section numbers, in Proceeding of 13th International Research/Expert Conference “Trends in the Development of Machinery and Associated Technology”, TMT 2009, Hammamet, Tunisia, 16 – 21 Oct, ISSN: 1840-4944, pp. 569 – 572

20. Stanciu M.D, Curtu I., Cerbu C., Timar I., **Itu C.**, The Simulation of Accidental Impact with Stones from Road Traffic in Case of Noise Barriers made of Different Materials, in Proceedings of 15th International Research/Experts Conference "Trends in the Development of Machinery and Associated Technology – TMT 2011, Praga 12-18 sep, ISSN: 1840 – 4944, pp. 629-632
21. **C. ITU**, C. CERBU, A. C.V. POPA, Computational methods concerning the simulation of the mechanical tests in case of some composite materials, in Proceeding of 3<sup>rd</sup> International Conference on "Computational Mechanics and Virtual Engineering", COMEC 2009, Braşov, 29 – 30 Oct, ISBN 978-973-598-572-1, pp. 113 – 116
22. Ulea, M., **Itu, C.**, FEM Analysis for Static Roll Over Test of a Bus Bodywork Section, in Proceeding of the 3<sup>rd</sup> International Conference "Advanced Composite Materials Engineering", COMAT 2010, Braşov, 27 – 29 Oct, Vol. 3, pp. 145 – 148, Braşov, România, ISSN: 1844 – 9336, pp. 264 – 268
23. **C. Itu**, M. L. Scutaru, Comparative dynamic analysis for a door car using different types of materials based on virtual simulation, in Proceedings of the 4th International Conference "Advanced Composite Materials Engineering", COMAT 2012 (DERC Publishing House, USA), 18 – 20 Oct, Braşov, România, pp. 386 – 390, ISBN-13: 978-0981730059, ISBN-10: 0981730059
24. **Itu Călin**, Curtu Ioan, Năstac Silviu, Stanciu Mariana Domnica, Particular Issues on Dynamics of Flexible Structures in E-Proceedings of the International Conference Challenges of the Knowledge Society, CKS – CERDOCT Doctoral Schools, Bucuresti, 15-16 Aprilie 2011, ISSN 2247 – 0875, ISSN – L 2247 – 0875, p. 663 – 668
25. Stanciu Mariana Domnica, Curtu Ioan, **Itu Călin**, Năstac Silviu, Savin Adriana, The Dynamic Behavior of Sound Barrier in case of Accidental Impact with Stones from Road Traffic, in E-Proceedings of the International Conference Challenges of the Knowledge Society, CKS – CERDOCT Doctoral Schools, Bucuresti, 14-15 Aprilie 2011, ISSN 2247 – 0875, ISSN – L 2247 – 0875, p. 669– 673
26. **Itu, C.**, Cerbu, Camelia, Virtual methods for the assessment of the forced response of a structure under the action of an external disruptive force, Proceeding of The 4th International Conference „Computational Mechanics and Virtual Engineering” COMEC



2011, Braşov, România, 20-22 October 2011, ISBN 978-973-131-122-7, Lux Libris Publishing House, p. 375-380

### **OTHER PAPERS / RELEVANT ACHIEVEMENTS**

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1. Member of the design - research - development team of the machine with a rated load of 8 tons and a lifting height of 14 meters - **1644 High Capacity - JLG.**

Project coordination: Sr. Chief Engineer Horia Haghiac, Perioada: 2014 - 2018

<https://www.jlg.com/en/equipment/telehandlers/jlg-telehandlers/1644-high-capacity>

2. Member of the design - research - development team of the machine with a rated load of 7 tons and a lifting height of 10 meters - **1732 High Capacity - JLG.**

Project coordination: Sr. Chief Engineer Horia Haghiac, Perioada: 2014 - 2018

<https://www.jlg.com/en/equipment/telehandlers/jlg-telehandlers/1732-high-capacity>

3. Member of the design - research - development team of the machine with a rated load of 12 tons and a lifting height of 10 meters - **T26 High Capacity - JLG.**

Project coordination: Sr. Chief Engineer Horia Haghiac, Perioada: 2014 - 2015

4. Member of the design - research - development team of the machine with a rated load of 4.5 tons and a lifting height of 23 meters - **1075 Telehandler High Reach - JLG.**

Project coordination: Sr. Chief Engineer Horia Haghiac, Perioada: 2019 - 2020

<https://www.jlg.com/en/equipment/telehandlers/jlg-telehandlers/1075>

Responsibilities within these projects:

- Coordination and management of the technical calculation team
- Generation of technical calculation memories
- Virtual simulations and analyzes using the finite element method
- Virtual simulations and analyzes using the multibody systems method
- Validations and correlations of the results from virtual simulations with experimental measurements

Date

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Author

Conf. dr. ing. ITU CĂLIN

Signature

