

## **A vortex ring model and its applications**

**Kaplanski, Felix** Abstract: <http://www2.math.kyushu-u.ac.jp/~masato/npa-old/index.html> : Seminar on Nonlinear Phenomena and Analysis, Kyushu University, Fukuoka, Japan, 28 January 2010

## **Applications of the models**

Danaila, Ionut; **Kaplanski, Felix**; Sazhin, Sergei Vortex Ring Models 2021 / p. 141-154 [https://doi.org/10.1007/978-3-030-68150-0\\_7](https://doi.org/10.1007/978-3-030-68150-0_7)  
[Article collection metrics at Scopus](#) [Article at Scopus](#)

## **Confined vortex rings**

Danaila, Ionut; **Kaplanski, Felix**; Sazhin, Sergei Vortex Ring Models 2021 / p. 103 - 119 [https://doi.org/10.1007/978-3-030-68150-0\\_5](https://doi.org/10.1007/978-3-030-68150-0_5)  
[Article collection metrics at Scopus](#) [Article at Scopus](#)

## **Dynamics of vortex rings and spray-induced vortex ring-like structures**

**Kaplanski, Felix**; Sazhin, Sergei; Begg, Steven; Fukumoto, Y.; Heikal, Morgan European journal of mechanics B. Fluids 2010 / 3, p. 208-216 : ill

## **Formation number of vortex rings**

Danaila, Ionut; **Kaplanski, Felix**; Sazhin, Sergei Vortex Ring Models 2021 / p. 121-139 [https://doi.org/10.1007/978-3-030-68150-0\\_6](https://doi.org/10.1007/978-3-030-68150-0_6)  
[Article collection metrics at Scopus](#) [Article at Scopus](#)

## **A generalized vortex ring model**

**Kaplanski, Felix**; Sazhin, Sergei; Fukumoto, Yasuhide; Begg, Steven; Heikal, Morgan Journal of fluid mechanics 2009 / p. 233-258

## **Global time evolution of an axisymmetric vortex ring at low Reynolds numbers**

Fukumoto, Yasuhide; **Kaplanski, Felix** Physics of fluids 2008 / p. 053103-1 - 053103-13 : ill  
<https://pubs.aip.org/aip/pof/article/20/5/053103/964428/Global-time-evolution-of-an-axisymmetric-vortex>

## **Global time evolution of an axisymmetric vortex ring at small Reynolds number**

**Kaplanski, Felix**; Fukumoto, Yasuhide ICTAM2008 Adelaide : XXII International Congress of Theoretical and Applied Mechanics : abstracts book 2008 / p. 73 <https://pubs.aip.org/aip/pof/article/20/5/053103/964428/Global-time-evolution-of-an-axisymmetric-vortex>

## **Global time evolution of viscous vortex rings**

Fukumoto, Yasuhide; **Kaplanski, Felix**; Moffatt, H.K. Abstracts of IUTAM Symposium 150 years of Vortex Dynamics 2008 / ? p  
<https://link.springer.com/article/10.1007/s00162-009-0155-0>

## **Jet and vortex ring-like structures in internal combustion engines : stability analysis and analytical solutions**

Sazhin, Sergei; Boronin, S.; **Kaplanski, Felix** Procedia IUTAM 2013 / p. 196-204

## **Jets and vortex ring-like structures in internal combustion engines : stability analysis and analytical solutions**

Sazhin, Sergei; Boronin, S.; Begg, Steven; Crua, C.; Heikal, Morgan; Healey, J.; Lebedeva, N.; Osipov, A.; **Kaplanski, Felix** IUTAM Symposium 12-3=GA.10-08 "Waves in fluids : Effects of Non-Linearity, Rotation, Stratification and Dissipation" Moscow, June 18-22, 2012 programme 2012 / [3] p <https://www.sciencedirect.com/science/article/pii/S2210983813000989>

## **A model for confined vortex rings with elliptical-core vorticity distribution**

Danaila, Ionut; **Kaplanski, Felix**; Sazhin, Sergei Journal of fluid mechanics 2017 / p. 67-94 : ill <https://doi.org/10.1017/jfm.2016.752>  
[Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

## **A model for high Reynolds number vortex rings**

**Kaplanski, Felix**; Fukumoto, Yasuhide; **Rudi, Ülo** Abstract book of the 23rd International Congress of Theoretical and Applied Mechanics : August 19-24, 2012, Beijing, China 2012 / p. 225-226 [https://www.researchgate.net/profile/Felix-Kaplanski/publication/278242787\\_A\\_model\\_for\\_high\\_Reynolds\\_number\\_vortex\\_rings/links/557eb0e508aeea18b778040d/A-model-for-high-Reynolds-number-vortex-rings.pdf?origin=scientific-contributions](https://www.researchgate.net/profile/Felix-Kaplanski/publication/278242787_A_model_for_high_Reynolds_number_vortex_rings/links/557eb0e508aeea18b778040d/A-model-for-high-Reynolds-number-vortex-rings.pdf?origin=scientific-contributions)

## **A Model for the formation of "optimal" vortex rings taking into account viscosity**

**Kaplanski, Felix**; **Rudi, Ülo** Physics of fluids 2005 / 8, [7] p <https://pubs.aip.org/aip/pof/article/17/8/087101/361381/A-model-for-the-formation-of-optimal-vortex-rings>

## **A model for the formation of "optimal" vortex rings with taking into account viscosity**

**Kaplanski, Felix**; **Rudi, Ülo** 21st International Congress of Theoretical and Applied Mechanics : August 15-21, 2004, Warsaw, Poland : ICTAM04 : abstracts and CD-ROM proceedings 2004 / p. 189 <https://pubs.aip.org/aip/pof/article/17/8/087101/361381/A-model-for-the-formation-of-optimal-vortex-rings>

## **Model for the formation of "optimal" vortex rings with taking into account viscosity [Electronic resource]**

**Kaplanski, Felix**; **Rudi, Ülo** Proceedings of the 21st IUTAM Congress : Warsaw, Poland 2005 / p. FM25 [CD-ROM]  
[https://www.researchgate.net/publication/278242738\\_A\\_model\\_for\\_the\\_formation\\_of\\_optimal\\_vortex\\_rings\\_with\\_taking\\_into\\_account\\_viscosity](https://www.researchgate.net/publication/278242738_A_model_for_the_formation_of_optimal_vortex_rings_with_taking_into_account_viscosity)

### **Modeling of a turbulent vortex ring**

**Kaplanski, Felix; Rudi, Ülo** Advances in turbulence XI : proceedings of the 11th EUROMECH European Turbulence Conference : June 25-28, 2007, Porto, Portugal 2007 / p. 304-306  
[https://www.researchgate.net/publication/251249595\\_Modeling\\_of\\_a\\_turbulent\\_vortex\\_ring](https://www.researchgate.net/publication/251249595_Modeling_of_a_turbulent_vortex_ring)

### **Modeling of a vortex ring flow**

Fukumoto, Y.; **Kaplanski, Felix** Reports of RIAM Symposium No. 18ME-S7 2007 / p. 112-118

### **Modeling of a vortex ring flow at high Reynolds number**

Fukumoto, Y.; **Kaplanski, Felix** Conference on Turbulence : Japan Research Institute for Applied Mechanics, Kyushu University, Japan 2006 / p. 201-208 [https://www.brighton.ac.uk/\\_pdf/research/cae/kaplanski%202.pdf](https://www.brighton.ac.uk/_pdf/research/cae/kaplanski%202.pdf)

### **Modeling of a vortex ring flow at high Reynolds number**

**Kaplanski, Felix;** Fukumoto, Y.; Sazhin, Sergei UK-Israel Workshop "Sprays : Modelling versus Experimentation" : Brighton, UK, July 16-18, 2007 2007 / ? p

### **Modelling and reconstruction of impulsively started flows using vortex ring models**

Zhang, Y.; Danaïla, Ionuț; **Kaplanski, Felix** Book of abstracts of European Fluid Mechanics Conference 9 : 9-13 September 2012, Roma, Italy 2012 / [1] p.: ill  
[https://www.researchgate.net/publication/278242781\\_Modelling\\_and\\_reconstruction\\_of\\_impulsively\\_started\\_flows\\_using\\_vortex\\_ring\\_models](https://www.researchgate.net/publication/278242781_Modelling_and_reconstruction_of_impulsively_started_flows_using_vortex_ring_models)

### **Modelling of a two-phase vortex-ring flow using an analytical solution for the carrier phase**

Rybdylova, O.; Sazhin, S.S.; Osipov, A.N.; **Kaplanski, Felix;** Begg, S.; Heikal, M. Applied mathematics and computation 2018 / 11 p. : ill <https://doi.org/10.1016/j.amc.2017.12.044> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

### **Modelling of confined vortex rings**

Danaïla, Ionuț; **Kaplanski, Felix;** Sazhin, Sergei Journal of fluid mechanics 2015 / p. 267-297 : ill <https://doi.org/10.1017/jfm.2015.261> [Journal metrics at Scopus](#) [Article at Scopus](#) [Journal metrics at WOS](#) [Article at WOS](#)

### **Modelling of optimal vortex ring formation using the Stokes approximation**

**Kaplanski, Felix; Rudi, Ülo** EUROMECH Fluid Mechanics Conference 6 : Stockholm, June 26-30, 2006 2006 / p. 110  
[https://www.researchgate.net/publication/278242829\\_Modeling\\_of\\_optimal\\_vortex\\_ring\\_formation\\_using\\_the\\_Stokes\\_approximation](https://www.researchgate.net/publication/278242829_Modeling_of_optimal_vortex_ring_formation_using_the_Stokes_approximation)

### **Motion of a vortex ring with swirl at low Reynolds numbers**

Fukumoto, Y.; **Kaplanski, Felix** Autumn meeting of Japan Physical Society, Osaka, Japan, September 23 2010  
[https://www.researchgate.net/publication/253012699\\_Motion\\_of\\_a\\_vortex\\_ring\\_with\\_swirl](https://www.researchgate.net/publication/253012699_Motion_of_a_vortex_ring_with_swirl)

### **New approaches to modelling vortex rings and vortex ring-like structures**

**Kaplanski, Felix;** Danaïla, Ionuț; Rybdylova, Oyuna; **Rudi, Ülo** Advances in heat transfer : proceedings of the 7th Baltic Heat Transfer Conference : Tallinn, Estonia, August 24-26, 2015 2015 / p. 35-40 : ill

### **Particle dynamics and mixing in an oscillating viscous vortex pair**

**Kaplanski, Felix;** Sazhin, Sergei; **Rudi, Ülo** Proceedings of the Estonian Academy of Sciences. Engineering 2005 / 2, p. 140-153 : ill [https://kirj.ee/wp-content/plugins/kirj/pub/eng-2-2005-140-153\\_20211119120244.pdf](https://kirj.ee/wp-content/plugins/kirj/pub/eng-2-2005-140-153_20211119120244.pdf)

### **Particle dynamics in a vortex ring [Electronic resource]**

**Kaplanski, Felix; Rudi, Ülo** Proceedings of the 5th International Conference on Multiphase Flow : ICMF-2004 : Yokohama, Japan, May 30-June 4, 2004 2004 / Paper No. 571. [CD-ROM]  
[https://www.researchgate.net/publication/278242733\\_Particle\\_dynamics\\_in\\_a\\_vortex\\_ring](https://www.researchgate.net/publication/278242733_Particle_dynamics_in_a_vortex_ring)

### **Particle dynamics in a vortex ring [Electronic resource]**

**Kaplanski, Felix;** Sashin, S.; **Rudi, Ülo** Proceedings of the 3rd International Symposium on Two-Phase Flow Modelling and Experimentation : ISTP-2004 : Pisa, Italy, September 22-26, 2004 2004 / paper No. as05 (6 p.). [CD-ROM]  
[https://www.researchgate.net/publication/278242733\\_Particle\\_dynamics\\_in\\_a\\_vortex\\_ring](https://www.researchgate.net/publication/278242733_Particle_dynamics_in_a_vortex_ring)

### **Particle motion in the vortices generated by a localized force**

**Kaplanski, Felix; Rudi, Ülo; Tisler, Sergei** Chemical and process engineering 2005 / 3, p. 427-436  
<https://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-article-BGPK-1183-5137>

### **Preface**

Danaïla, Ionuț; **Kaplanski, Felix;** Sazhin, Sergei Vortex Ring Models 2021 / p. vii <https://link.springer.com/content/pdf/bfm:978-3-030-68150-0/1?pdf=chapter%20toc> [Article collection metrics at Scopus](#) [Article at Scopus](#)

### **Reynolds-number effect on vortex ring evolution**

**Kaplanski, Felix;** Fukumoto, Y.; **Rudi, Ülo** Recent Progresses in Fluid Dynamics Research : proceedings of the Sixth International Conference on Fluid Mechanics, 30 June - 3 July, 2011, Guangzhou, China 2011 / p. 57-60 : ill  
[https://www.researchgate.net/publication/234946883\\_Reynolds-number\\_Effect\\_on\\_Vortex\\_Ring\\_Evolution](https://www.researchgate.net/publication/234946883_Reynolds-number_Effect_on_Vortex_Ring_Evolution)

### **Reynolds-number effect on vortex ring evolution in a viscous fluid**

**Kaplanski, Felix**; Fukumoto, Yasuhide; **Rudi, Ülo** Physics of fluids 2012 / p. 033101-1 - 033101-13  
[https://www.researchgate.net/publication/234946883\\_Reynolds-number\\_Effect\\_on\\_Vortex\\_Ring\\_Evolution](https://www.researchgate.net/publication/234946883_Reynolds-number_Effect_on_Vortex_Ring_Evolution)

### **Spray dynamics as a multi-scale process**

Sazhin, Sergei; Martynov, S.; **Kaplanski, Felix**; Begg, Steven Journal of physics : conference series 2008 / p. 012024 [13 p.]

### **Steady inviscid vortex rings**

Danaila, Ionut; **Kaplanski, Felix**; Sazhin, Sergei Vortex Ring Models 2021 / p. 17-49 [https://doi.org/10.1007/978-3-030-68150-0\\_2](https://doi.org/10.1007/978-3-030-68150-0_2)  
[Article collection metrics at Scopus](#) [Article at Scopus](#)

### **The evolution of an elliptic vortex ring in viscous fluid**

**Kaplanski, Felix**; Sazhin, Sergei; Fukumoto, Y.; **Rudi, Ülo** Euromech Fluid Mechanics Conference - 8 (EFMC-8) : September 13-16, 2010, Bad Reichenhall, Germany : book of abstracts 2010 / p. S15-9 : ill  
[https://www.researchgate.net/publication/278242848\\_The\\_evolution\\_of\\_an\\_elliptical\\_vortex\\_ring\\_in\\_viscous\\_fluid](https://www.researchgate.net/publication/278242848_The_evolution_of_an_elliptical_vortex_ring_in_viscous_fluid)

### **Time-dependent properties of a viscous vortex ring**

Kaplanski, Felix; Rudi, Ülo Proceedings of the Estonian Academy of Sciences. Engineering 1997 / 3, p. 171-184

### **Transport processes in an oscillating vortex pair and rings**

**Kaplanski, Felix**; **Rudi, Ülo** NATO Advanced Study Institute Flow and Transport Processes in Complex Obstructed Geometries : from Cities and Vegetative Canopies to Industrial Problems : Kyiv, Ukraine, May 4-12, 2004 2004 / p. 110-112

### **Viscous vortex rings**

Danaila, Ionut; **Kaplanski, Felix**; Sazhin, Sergei Vortex Ring Models 2021 / p. 51-86 [https://doi.org/10.1007/978-3-030-68150-0\\_3](https://doi.org/10.1007/978-3-030-68150-0_3)  
[Article collection metrics at Scopus](#) [Article at Scopus](#)

### **Viscous vortex rings with elliptical cores**

Danaila, Ionut; **Kaplanski, Felix**; Sazhin, Sergei Vortex Ring Models 2021 / p. 87 - 102 [https://doi.org/10.1007/978-3-030-68150-0\\_4](https://doi.org/10.1007/978-3-030-68150-0_4)  
[Article collection metrics at Scopus](#) [Article at Scopus](#)

### **The vortex ring problem**

Danaila, Ionut; **Kaplanski, Felix**; Sazhin, Sergei Vortex Ring Models 2021 / p. 1-15 [https://doi.org/10.1007/978-3-030-68150-0\\_1](https://doi.org/10.1007/978-3-030-68150-0_1) [Article collection metrics at Scopus](#) [Article at Scopus](#)

### **Vortex ring-like structures in a non-evaporating gasoline-fuel spray : simplified models versus experimental results**

Sazhin, Sergei; **Kaplanski, Felix**; Begg, Steven; Heikal, Morgan SAE Technical Papers : SAE, International Powertrains, Fuels & Lubricants Meeting, May 5-7 2010 / SAE paper 2010-01-1491, [16] p [https://www.ilasseurope.org/ICLASS/ILASS2008\\_COMO/file/papers/6-5.pdf](https://www.ilasseurope.org/ICLASS/ILASS2008_COMO/file/papers/6-5.pdf)

### **Vortex ring-like structures in gasoline fuel sprays : modelling and observations [Electronic resource]**

Sazhin, Sergei; **Kaplanski, Felix**; Begg, Steven; Heikal, Morgan ILASS 2008 : 22nd European Conference on Liquid Atomization and Spray Systems : September 8-10, 2008, Como Lake, Italy 2008 / p. paper 6-5 [CD-ROM]  
[https://www.researchgate.net/publication/278242920\\_Vortex\\_ring-like\\_structures\\_in\\_gasoline\\_fuel\\_sprays\\_modelling\\_and\\_observations](https://www.researchgate.net/publication/278242920_Vortex_ring-like_structures_in_gasoline_fuel_sprays_modelling_and_observations)

### **Vortex ring-like structures in gasoline fuel sprays [Electronic resource]**

Sazhin, Sergei; **Kaplanski, Felix**; Begg, Steven; Heikal, Morgan Proceedings of the JUMY International Automotive Conference and Exhibition : XXII Science and Motor Vehicles 2009 : Belgrade, 14-16 April, 2009 2009 / Paper 31 [CD-ROM]  
[https://www.ilasseurope.org/ICLASS/ILASS2008\\_COMO/file/papers/6-5.pdf](https://www.ilasseurope.org/ICLASS/ILASS2008_COMO/file/papers/6-5.pdf)

### **Vortex ring-like structures in gasoline fuel sprays under cold-start conditions**

Begg, Steven; **Kaplanski, Felix**; Sazhin, Sergei; Hindle, M.; Heikal, Morgan International journal of engine research 2009 / 4, p. 195-214 [https://www.researchgate.net/publication/239580543\\_Vortex\\_ring-like\\_structures\\_in\\_gasoline\\_fuel\\_sprays\\_under\\_cold-start\\_conditions](https://www.researchgate.net/publication/239580543_Vortex_ring-like_structures_in_gasoline_fuel_sprays_under_cold-start_conditions)

### **Vortex rings in a viscous fluid : asymptotic theory and numerical simulations**

**Kaplanski, Felix**; Fukumoto, Yasuhide; Sazhin, Sergei EUROMECH Fluid Mechanics Conference 7 : University of Manchester, 14-18 September 2008 : abstracts 2008 / p. 169 : ill [https://www.researchgate.net/profile/Felix-Kaplanski/publication/278299986\\_Vortex\\_rings\\_in\\_a\\_viscous\\_fluid\\_Asymptotic\\_theory\\_and\\_numerical\\_simulations/links/557e835008aeb61eae248274/Vortex-rings-in-a-viscous-fluid-Asymptotic-theory-and-numerical-simulations.pdf](https://www.researchgate.net/profile/Felix-Kaplanski/publication/278299986_Vortex_rings_in_a_viscous_fluid_Asymptotic_theory_and_numerical_simulations/links/557e835008aeb61eae248274/Vortex-rings-in-a-viscous-fluid-Asymptotic-theory-and-numerical-simulations.pdf)

### **Vortex rings in internal combustion engines : modelling versus experiment**

Sazhin, Sergei; **Kaplanski, Felix**; Begg, Steven; Heikal, Morgan Proceedings of the 19th International Symposium on Transport Phenomena (ISTP-19) : Reykjavik, Iceland, August 17-20, 2008 2008 / p. 133-140 [https://www.researchgate.net/profile/Felix-Kaplanski/publication/278242750\\_Vortex\\_rings\\_in\\_internal\\_combustion\\_engines\\_modelling\\_versus\\_experiment/links/557ed2e208a87640ddea88/Vortex-rings-in-internal-combustion-engines-modelling-versus-experiment.pdf](https://www.researchgate.net/profile/Felix-Kaplanski/publication/278242750_Vortex_rings_in_internal_combustion_engines_modelling_versus_experiment/links/557ed2e208a87640ddea88/Vortex-rings-in-internal-combustion-engines-modelling-versus-experiment.pdf)