Bibliographie du cours "Stabilité des écoulements parallèles"

Th. Gallay, 1er juin 2021

I : Quelques références historiques et autres monographies

[1] Lord Rayleigh, On the Stability, or Instability, of certain Fluid Motions, Proc. Lond. Math. Soc. **11** (1879/1880), 57–70.

[2] O. Reynolds, An experimental investigation of the circumstances which determine whether the motion of water shall be direct or sinuous, and of the law of resistance in parallel channels, Phil. Trans. Roy. Soc. A **174** (1883), 935–982.

[3] Lord Kelvin, Stability of fluid motion: rectilinear motion of viscous fluid between two parallel plates, Philos. Mag. **24** (1887), 188–196.

[4] W. Orr, The Stability or Instability of the Steady Motions of a Perfect Liquid and of a Viscous Liquid. Part I: A Perfect Liquid. Part II: A Viscous Liquid, Proc. Roy. Irish Academy **27** (1907), 9–138.

[5] A. Sommerfeld, Ein Beitrag zur hydrodynamischen Erklärung der turbulenten Fluessigkeitsbewegungen, Proceedings of the 4th International Congress of Mathematicians, Rome 1908, vol. III, 116–124.

[6] G. I. Taylor, Stability of a Viscous Liquid Contained between Two Rotating Cylinders. Phil. Trans. Roy. Soc. A **223** (1923), 289–343.

[7] W. Tollmien, Über die Entstehung der Turbulenz, Nachr. Ges. Wiss. Göttingen (1929), 21–44.

[8] H. Schlichting, Zur Enstehung der Turbulenz bei der Plattenströmung, Nachr. Ges. Wiss. Göttingen (1933), 181–208.

[9] C. C. Lin, *The Theory of Hydrodynamic Stability*, Cambridge University Press, 1955.

[10] S. Chandrasekhar, *Hydrodynamic and Hydromagnetic Stability*, Oxford University Press, 1961.

[11] V. Romanov, Stability of plane-parallel Couette flow, Funct. Anal. Its Appl. **7** (1973), 137–146.

[12] P. G. Drazin and W. H. Reid, *Hydrodynamic stability*, Cambridge University Press, 1981.

II : Écoulements parallèles plans

A : cas non visqueux (Euler)

A1 : écoulement de Couette

[13] Zhiwu Lin and Chongchun Zeng, Inviscid dynamical structures near Couette flow, ARMA **200** (2011), 1075–1097.

[14] J. Bedrossian and N. Masmoudi, Inviscid damping and the asymptotic stability of planar shear flows in the 2D Euler equations, Publ. math. de l'IHES **122** (2015), 195–300.

[15] J. Bedrossian and N. Masmoudi, Asymptotic stability for the Couette flow in the 2D Euler equations, Appl. Math. Res. Express. AMRX **2014**, 157–175.

[16] Yu Deng and N. Masmoudi, Long time instability of the Couette flow in low Gevrey spaces, preprint arXiv:1803.01246, to appear in CPAM.

[17] A. Ionescu and Hao Jia, Inviscid damping near shear flows in a channel, CMP **374** (2020), 2015–2096.

[18] M. Dolce, Nonlinear inviscid damping for zero mean perturbation of the 2D Euler Couette flow, preprint arXiv:1903.01543.

[19] Yu Deng and Ch. Zillinger, Echo Chains as a Linear Mechanism: Norm Inflation, Modified Exponents and Asymptotics, preprint arXiv:1910.12914.

A2 : écoulements monotones plus généraux

[20] Ch. Zillinger, Linear inviscid damping for monotone shear flows in a finite periodic channel, boundary effects, blow-up and critical Sobolev regularity, ARMA **221** (2016), 1449–1509.

[21] Ch. Zillinger, Linear inviscid damping for monotone shear flows, Trans. Amer. Math. Soc. **369** (2017), 8799–8855.

[22] Dongyi Wei, Zhifei Zhang, and Weiren Zhao, Linear inviscid damping for a class of monotone shear flow in Sobolev spaces, CPAM **71** (2018), 617–687.

[23] Hao Jia, Linear inviscid damping near monotone shear flows, Siam J. Math Analysis **52** (2020), 623–652.

[24] Hao Jia, Linear inviscid damping in Gevrey spaces, ARMA **235** (2020), 1327–1355.

[25] Ch. Zillinger, Linear Inviscid Damping in Sobolev and Gevrey Spaces, preprint arXiv:1911.00880.

[26] Yu Deng and Ch. Zillinger, On the Smallness Condition in Linear Inviscid Damping: Monotonicity and Resonance Chains, Nonlinearity **33** (2020), 6176.

[27] A. Ionescu and Hao Jia, Nonlinear inviscid damping near monotonic shear flows, preprint arXiv:2001.03087.

A3 : écoulements non monotones (dont Poiseuille et Kolmogorov)

[28] Zhiwu Lin, Instability of some ideal plane flows, SIAM J. Math. Anal. **35** (2003), 318–356.

[29] F. Bouchet and H. Morita, Large time behavior and asymptotic stability of the 2D Euler and linearized Euler equations, Physica D **239** (2010), 948–966.

[30] Zhiwu Lin and Chongchun Zeng, Unstable Manifolds of Euler Equations, CPAM **66** (2013), 1803–1836.

[31] Dongyi Wei, Zhifei Zhang, and Weiren Zhao, Linear inviscid damping and vorticity depletion for shear flows, Annals of PDE **5** (2019), article 3, 101 p.

B : Cas visqueux (Navier-Stokes)

B1 : scalaires passifs

[32] P. Constantin, A. Kiselev, L. Ryzhik, and A. Zlatos, Diffusion and mixing in fluid flow, Ann. Math. **168** (2008), 643–674.

[33] J. Bedrossian and M. Coti Zelati, Enhanced dissipation, hypoellipticity, and anomalous small noise inviscid limits in shear flows, ARMA **224** (2017), 1161–1204.

[34] M. Coti Zelati, M. Delgadino, and T. Elgindi, On the relation between enhanced dissipation time-scales and mixing rates, CPAM **73** (2020), 1205–1244.

[35] M. Beck, O. Chaudhary, and C. E. Wayne, Rigorous justification of Taylor dispersion via center manifolds and hypocoercivity, ARMA **235** (2020) 1105–1149.

[36] M. Coti Zelati, Stable mixing estimates in the infinite Péclet number limit, J. Functional Analysis **279** (2020), 108562.

[37] M. Coti Zelati and T.D. Drivas, A stochastic approach to enhanced diffusion, to appear in Annali della Scuola Normale Superiore di Pisa (2020).

[38] Dongyi Wei, Diffusion and mixing in fluid flow via the resolvent estimate, Sci. China Math. **64** (2021), 507–518.

[39] M. Colombo, M. Coti Zelati and K. Widmayer, Mixing and diffusion for rough shear flows, preprint arXiv:2009.12268.

[40] D. Albritton, R. Beekie and M. Novack, Enhanced dissipation and Hörmander's hypoellipticity, preprint arXiv:2105.12308.

B2 : écoulement de Couette

[41] J. Bedrossian, N. Masmoudi, and V. Vicol, Enhanced dissipation and inviscid damping in the inviscid limit of the Navier-Stokes equations near the two dimensional Couette flow, ARMA **219** (2016), 1087–1159.

[42] J. Bedrossian, V. Vicol, and Fei Wang, The Sobolev stability threshold for 2D shear flows near Couette, J. Nonlinear Sci. **28** (2018), 2051–2075.

[43] Ch. Zillinger, On the forced Euler and Navier-Stokes equations: Linear damping and modified scattering, JMFM **21** (2019), article 49.

[44] N. Masmoudi and Weiren Zhao, Enhanced dissipation for the 2D Couette flow in critical space, CPDE **45** (2020), 1682–1701.

[45] N. Masmoudi and Weiren Zhao, Stability threshold of the 2D Couette flow in Sobolev spaces, arXiv:1908.11042.

B3 : écoulements plus généraux (NS linéarisé, ou NS complet)

[46] M. Beck and C. E. Wayne, Metastability and rapid convergence to quasi-stationary bar states for the two-dimensional Navier-Stokes equations, Proc. Roy. Soc. Edinburgh Sect. A **143** (2013), 905–927.

[47] S. Ibrahim, Y. Maekawa, and N. Masmoudi, On pseudospectral bound for non-selfadjoint operators and its application to stability of Kolmogorov flows, arXiv:1710.05132.

[48] Dongyi Wei, Zhifei Zhang, and Weiren Zhao, Linear inviscid damping and enhanced dissipation for the Kolmogorov flow, Advances in Mathematics **362** (2020), 106963, 103 p.

[49] Zhiwu Lin and Ming Xu, Metastability of Kolmogorov flows and inviscid damping of shear flows, ARMA **231** (2019), 1811–1852.

[50] E. Grenier, T. Nguyen, F. Rousset, and A. Soffer, Linear inviscid damping and enhanced viscous dissipation of shear flows by using the conjugate operator method, J. of Functional Analysis **278** (2020), 108339.

[51] M. Coti Zelati, T. Elgindi, and K. Widmayer, Enhanced dissipation in the Navier-Stokes equations near the Poiseuille flow, CMP **378** (2020), 987–1010.

[52] Dongyi Wei and Zhifei Zhang, Enhanced dissipation for the Kolmogorov flow via the hypocoercivity method, Z. Sci. China Math (online 2019).

B4 : écoulements en présence de bords

[53] Charles Li and Zhiwu Lin, A resolution of the Sommerfeld paradox, SIAM J. Math. Anal. **43** (2011), 1923–1954.

[54] E. Grenier, Yan Guo, and Toan Nguyen, Spectral instability of characteristic boundary layer flows, Duke Math. J. **165** (2016), 3085–3146.

[55] E. Grenier, Yan Guo, and Toan Nguyen, Spectral instability of general symmetric shear flows in a two-dimensional channel, Adv. Math. **292** (2016), 52–110.

[56] D. Gérard Varet, Y. Maekawa and N. Masmoudi, Gevrey stability of Prandtl expansions for 2-dimensional Navier-Stokes flows, Duke Math. J. **167** (2018), 2531–2631.

[57] E. Grenier and Toan Nguyen, Green function of Orr-Sommerfeld equations away from critical layers, SIAM J. Math Anal. (2019).

[58] E. Grenier and Toan Nguyen, Green function for linearized Navier-Stokes around a boundary layer profile: near critical layers, arXiv:1705.05323.

[59] E. Grenier and Toan Nguyen, Green function for linearized Navier-Stokes around a boundary shear layer profile for long wavelengths, preprint arXiv:1910.03988.

[60] E. Grenier and Toan Nguyen, On nonlinear instability of Prandtl's boundary layers: the case of Rayleigh's stable shear flows, J. Math Pures Appliquées (2019).

[61] E. Grenier and Toan Nguyen, Sublayer of Prandtl boundary layers, ARMA **229** (2018), 1139–1151.

[62] E. Grenier and Toan Nguyen, L^∞ instability of Prandtl layers, Annals PDE **5** (2019), article 18.

[63] E. Grenier and Toan Nguyen, Sharp bounds for the resolvent of linearized Navier-Stokes equations in the half space around a shear profile, JDE **269** (2020), 9384–9403.

[64] Qi Chen, Te Li, Dongyi Wei and Zhifei Zhang, Transition threshold for the 2-D Couette flow in a finite channel, ARMA **238** (2020), 125–183.

[65] J. Bedrossian and Siming He, Inviscid damping and enhanced dissipation of the boundary layer for 2D Navier-Stokes linearized around Couette flow in a channel, preprint arXiv:1909.07230.

[66] Y. Almog and B. Helffer, On the stability of laminar flows between plates, arXiv:1908.06328.

III : tourbillons plans

C : cas non visqueux (Euler)

[67] Ch. Zillinger, On circular flows: linear stability and damping, JDE **263** (2017), 7856–7899.

[68] J. Bedrossian, M. Coti Zelati, and V. Vicol, Vortex axisymmetrization, inviscid damping, and vorticity depletion in the linearized 2d Euler equations, Annals of PDE **5** (2019).

[69] M. Coti Zelati and Ch. Zillinger, On degenerate circular and shear flows: the point vortex and power law circular flows, CPDE **44** (2019), 110–155.

[70] A. Ionescu and Hao Jia, Axi-symmetrization near point vortex solutions for the 2D Euler equation, preprint arXiv:1904.09170, to appear in CPAM.

D : cas visqueux (Navier-Stokes)

[71] Th. Gallay, Enhanced Dissipation and Axisymmetrization of Two-Dimensional Viscous Vortices, ARMA **230** (2018), 939–975.

[72] Te Li, Dongyi Wei, and Zhifei Zhang, Pseudospectral and spectral bounds for the Oseen vortices operator, Annales Sci. ENS **53** (2020), 993–1035.

[73] M. Coti Zelati and M. Dolce, Separation of time-scales in drift-diffusion equations on $\mathbb{R}^2$, J. de Math. Pures et Appliquées **142** (2020), 58–75.

IV : écoulements parallèles 3D

[74] J. Bedrossian, P. Germain, and N. Masmoudi, On the stability threshold for the 3D Couette flow in Sobolev regularity, Ann. of Math. **185** (2017), 541–608.

[75] J. Bedrossian, P. Germain, and N. Masmoudi, Dynamics near the subcritical transition of the 3D Couette flow I: Below threshold case, Memoirs AMS **266**, AMS, 2020.

[76] J. Bedrossian, P. Germain, and N. Masmoudi, Dynamics near the subcritical transition of the 3D Couette flow II: Above threshold case, arXiv:1506.03721.

[77] Dongyi Wei and Zhifei Zhang, Transition threshold for the 3D Couette flow in Sobolev space, CPAM (online 2020).

[78] Te Li, Dongyi Wei and Zhifei Zhang, Pseudospectral bound and transition threshold for the 3D Kolmogorov flow, CPAM **73** (2020), 465–557.

[79] Qi Chen, Dongyi Wei, Zhifei Zhang, Linear stability of pipe Poiseuille flow at high Reynolds number regime, arXiv:1910.14245.

[80] Qi Chen, Dongyi Wei and Zhifei Zhang, Transition threshold for the 3D Couette flow in a finite channel, preprint arXiv:2006.00721.

ARMA = Archive for Rational Mechanics and Analysis
CMP = Communications in Mathematical Physics
CPAM = Communications in Pure and Applied Mathematics
CPDE = Communications in Partial Differential Equations
JDE = Journal of Differential Equations
JMFM = Journal of Mathematical Fluid Mechanics