

Publications, Jonas Nycander

1 Review articles

1. **Nycander, J.**, 1994. Steady vortices in plasmas and geophysical flows. *Chaos* **4**, 253-267.
2. Turnewitsch, R., Falahat, S., **Nycander, J.**, Dale, A., Scott, R.B. and Furnival, D., 2013. Deep-sea fluid and sediment dynamics – Influence of hill- to seamount-scale seafloor topography. *Earth-Science Reveiws* **127**, 203–241.

2 Peer-reviewed articles

1. **Nycander, J.** and Wahlberg, C., 1984. Influence of the current profile on the growth rate of $m = 1$ kink modes in a pure z-pinch. *Nucl. Fusion* **24**, 1357-1360.
2. **Nycander, J.**, Pavlenko, V.P. and Revenchuk, S.M., 1986. Echo in a weakly turbulent plasma. *Fiz. Plazmy* **12**, 402-407 [*Soviet J. Plasma Phys.* **12**, 231].
3. **Nycander, J.**, Pavlenko, V.P. and Revenchuk, S.M., 1986. Echo in a magnetized weakly turbulent plasma. *Plasma Phys. Contr. Fusion* **28**, 1659-1673.
4. **Nycander, J.**, Pavlenko, V.P. and Revenchuk, S.M., 1986. Space-time echo in an unmagnetized weakly turbulent plasma. *Physica Scripta* **34**, 819-820.
5. **Nycander, J.** and Taranov, V.B., 1987. Self-similar drift waves in two dimensions. *Phys. Lett. A* **119**, 351-353.

6. **Nycander, J.**, Pavlenko, V.P. and Stenflo, L., 1987. Magnetic vortices in nonuniform plasmas. *Phys. Fluids* **30**, 1367-1370.
7. **Nycander, J.** and Pavlenko, V.P., 1987. Global vortex pattern in a rotating plasma. *Phys. Fluids* **30**, 2097-2100.
8. **Nycander, J.**, 1987. Propagation of discontinuities in the Hasegawa-Mima equation, *Phys. Fluids* **30**, 1585-1587
9. **Nycander, J.**, 1988. New stationary vortex solutions of the Hasegawa-Mima equation. *J. Plasma Phys.* **39**, 413-430.
10. **Nycander, J.**, 1989. The effect of the electron temperature gradient on nonlinear drift waves in plasmas. *Physica Scripta* **39**, 758-763.
11. **Nycander, J.**, 1989. The existence of stationary vortex solutions of the equations for nonlinear drift waves in plasmas and nonlinear Rossby waves. *Phys. Fluids B* **1**, 1788-1796.
12. **Nycander, J.** and Isichenko, M.B., 1990. Motion of dipole vortices in a weakly inhomogeneous medium and related convective transport. *Phys. Fluids B* **2**, 2042-2047.
13. **Nycander, J.** and Pavlenko, V.P., 1991. Localized flute vortices in plasmas. *Physica Scripta* **43**, 95-99.
14. **Nycander, J.**, 1991. Stationary drift vortices with large amplitude. *Phys. Fluids B* **3**, 931-937.
15. **Nycander, J.** and Pavlenko, V.P., 1991. Stationary propagating magnetic electron vortices. *Phys. Fluids B* **3**, 1386-1391.
16. **Nycander, J.**, 1991. Comment on 'Dipole and Monopole Vortices in Nonlinear Drift Waves'. *Phys. Rev. Lett.* **67**, 1671.
17. **Nycander, J.** and Sutyrin, G.G., 1992. Steadily translating anticyclones on the beta plane. *Dyn. Atmos. Oceans* **16**, 473-498.
18. **Nycander, J.**, 1992. Refutation of stability proofs for dipole vortices. *Phys. Fluids A* **4**, 467-476.

19. Hesthaven, J.S., Lynov, J.P. and **Nycander, J.**, 1993. Dynamics of non-stationary dipole vortices. *Phys. Fluids A* **5**, 622-629.
20. **Nycander, J.**, Dritschel, D. and Sutyrin, G.G., 1993. The dynamics of long frontal waves in the shallow water equations. *Phys. Fluids A* **5**, 1089-1091.
21. **Nycander, J.**, 1993. Difference between monopole vortices in planetary flows and laboratory experiments. *J. Fluid Mech.* **254**, 561-577.
22. **Nycander, J.**, Lynov, J.P. and Rasmussen, J.J., 1993. Localized vortices in eta-i modes. *Europhys. Lett.* **23**, 249-255.
23. Aristov, S.N. and **Nycander, J.**, 1994. Convective flow in baroclinic vortices. *J. Phys. Oceanogr.* **24**, 1841-1849.
24. **Nycander, J.** and Yankov, V.V., 1995. Anomalous pinch flux in tokamaks driven by the longitudinal adiabatic invariant. *Phys. Plasmas* **2**, 2874-2876.
25. Yankov, V.V. and **Nycander, J.**, 1995. Comment on 'Invariant measure and turbulent pinch in tokamaks', *Phys. Rev. Lett.* **75**, 3582.
26. **Nycander, J.**, 1995. Existence and stability of stationary vortices in a uniform shear flow. *J. Fluid Mech.* **287**, 119-132.
27. **Nycander, J.**, 1996. Analogy between the drift of planetary vortices and the precession of a spinning body. *Plasma Phys. Reports* **22**, 771-774.
28. Pakyari, A.R. and **Nycander, J.**, 1996. Steady two-layer vortices on the beta-plane. *Dyn. Atmos. Oceans* **25**, 67-86.
29. Åkerstedt, H.O., **Nycander, J.** and Pavlenko, V.P., 1996. Three-dimensional stability of drift vortices. *Phys. Plasmas* **3**, 160-167.
30. **Nycander, J.** and Yankov, V.V., 1996. Turbulent equipartition and up-gradient transport. *Physica Scripta* **T63**, 174-181.
31. **Nycander, J.** and Yankov, V.V., 1996. H-mode in tokamaks attributed to the absence of trapped ions in poloidally rotating plasma. *JETP Lett.* **63**, 448-452.

32. Yankov, V.V. and **Nycander, J.**, 1997. Transport suppression by reversed magnetic shear. *Comments Plasma Phys. Contr. Fusion, Comments Mod. Phys.* **18**, 1-10.
33. Yankov, V.V. and **Nycander, J.**, 1997. Description of turbulent transport in tokamaks by invariants. *Phys. Plasmas* **4**, 2907-2919.
34. **Nycander, J.** and Rasmussen, J.J., 1997. Pinch effect in two-dimensional turbulence. *Plasma Phys. Contr. Fusion* **39**, 1861-1869.
35. Naulin, V., **Nycander, J.** and Rasmussen, J.J., 1998. Equipartition and transport in two-dimensional electrostatic turbulence. *Phys. Rev. Lett.* **81**, 4148-4151.
36. Burton, G.R. and **Nycander, J.**, 1999. Stationary vortices in three-dimensional quasigeostrophic shear flow. *J. Fluid Mech.* **398**, 255-274.
37. Yankov, V.V. and **Nycander, J.**, 2000. Sawtooth oscillations and collisionless reconnection in tokamaks. *Comments Plasma Phys. Contr. Fusion, Comments Mod. Phys.* **2**, Part C, 1-6.
38. Yankov, V.V. and **Nycander, J.**, 2000. Could Reversed Field Pinches and quasi-helical Stellarators benefit from transport suppression in tokamaks? *Plasma Phys. Rep.* **26**, 737-740.
39. **Nycander, J.**, 2001. Drift velocity of radiating quasigeostrophic vortices. *J. Phys. Oceanogr.* **31**, 2178-2185.
40. **Nycander, J.**, Döös, K. and Coward, A.C., 2002. Chaotic and regular trajectories in the Antarctic Circumpolar Current. *Tellus* **54A**, 99-106.
41. **Nycander, J.** and Emamizadeh, B., 2003. Variational problem for vortices attached to seamounts. *Nonlinear Analysis* **55**, 15-24.
42. **Nycander, J.** and Döös, K., 2003. Open boundary conditions for barotropic waves. *J. Geophys. Res.* **108** (C5), 37.
43. Naulin, V., Juul Rasmussen, J. and **Nycander, J.**, 2003. Transport barriers and edge localized modes-like bursts in a plasma model with turbulent equipartition profiles. *Phys. Plasmas* **10**, 1075-1082.

44. Döös, K., **Nycander, J.** and Sigray, P., 2004. Slope dependent friction in a barotropic model. *J. Geophys. Res.* **109**, C01008, doi:10.1029/2002JC001517.
45. **Nycander, J.** and LaCasce, J.H., 2004. Stable and unstable vortices attached to seamounts. *J. Fluid Mech.* **507**, 71–94.
46. Benilov, E.S., **Nycander, J.** and Dritschel, D.G., 2004. Destabilisation of barotropic flows by small-scale topography. *J. Fluid Mech.* **517**, 359–374.
47. Marchal, O. and **Nycander, J.**, 2004. Nonuniform upwelling in a shallow-water model in the Antarctic Bottom Water in the Brazil Basin. *J. Phys. Oceanogr.* **34**, 2492–2513.
48. **Nycander, J.**, 2005. Generation of internal waves in the deep ocean by tides. *J. Geophys. Res.* **110**, C10028, doi:10.1029/2004JC002487.
49. **Nycander, J.**, 2006. Tidal generation of internal waves from a periodic array of steep ridges. *J. Fluid Mech.* **567**, 415–432.
50. Bahrami, F. and **Nycander, J.**, 2007. Existence of energy minimizing vortices attached to a flat-top seamount. *Nonlinear Analysis: Real World Applications* **8**, 288–294.
51. **Nycander, J.**, Nilsson, J., Döös, K. and Broström, G., 2007. Thermodynamic analysis of ocean circulation. *J. Phys. Oceanogr.* **37**, 2038–2052.
52. Jakobsson, M., Backman, J., Rudels, B., **Nycander, J.**, Frank, M., Mayer, L., Jokat, W., Sangiorgi, F., O'Reagan, M., Brinkhuis, H., King, J. and Moran, K., 2007. The Early Miocene onset of a ventilated circulation regime in the Arctic Ocean. *Nature* **447**, 986–990.
53. Jönsson, B., Döös, K., **Nycander, J.** and Lundberg, P., 2008. Standing waves in the Gulf of Finland and their relationship to the basin-wide Baltic seiches. *J. Geophys. Res.* **113**, C03004, doi:10.1029/2006JC003862.
54. Nøst, O.A., Nilsson, J. and **Nycander, J.**, 2008. On the asymmetry between cyclonic and anticyclonic flow in basins with sloping boundaries. *J. Phys. Oceanogr.* **38**, 771–787.

55. Döös,, K., **Nycander, J.** and Coward, A.C., 2008. Lagrangian decomposition of the Deacon Cell. *J. Geophys. Res.* **113**, C07028, doi:10.1029/2007JC004351.
56. **Nycander, J.**, Hogg, A.M. and Frankcombe, L.M., 2008. Open boundary conditions for nonlinear channel flow. *Ocean Modelling* **24**, 108–121.
57. Turnewitsch, R., Reyss, J.-L., **Nycander, J.**, Waniek, J.J., and Lam-pitt, R.S., 2008. Internal tides and sediment dynamics in the deep sea - evidence from radioactive $^{234}\text{Th}/^{238}\text{U}$ disequilibria. *Deep-Sea Res. I* **55**, 1727–1747.
58. Magnusson, L.E., Källén, E. and **Nycander, J.**, 2008. Initial state perturbations in ensemble forecasting. *Nonlinear processes in Geophysics* **15**, 751–759.
59. Magnusson, L.E., **Nycander, J.** and Källén, E., 2009. Flow-dependent versus flow-independent initial perturbations for ensemble prediction. *Tellus* **61A**, 194–209.
60. Bahrami, F., **Nycander, J.** and Alikhani, R., 2010. Existence of energy maximizing vortices in a three-dimensional quasigeostrophic shear flow with bounded height. *Nonlinear Analysis: Real World Applications* **11**, 1589–1599.
61. Zarroug, M., **Nycander, J.** and Döös, K., 2010. Energetics of tidally generated internal waves for nonuniform stratification. *Tellus* **62A**, 71–79.
62. **Nycander, J.**, 2010. Horizontal convection with a nonlinear equation of state: generalization of a theorem of Paparella and Young. *Tellus* **62A**, 134–137.
63. Thompson, B., Nilsson, J., **Nycander, J.**, Jakobsson, M. and Döös, K., 2010. Ventilation of the Miocene Arctic ocean: an idealized model study. *Paleoceanography* **25**, PA4216, doi:10.1029/2009PA001883.
64. **Nycander, J.**, 2011. Energy conversion, mixing energy, and neutral surfaces with a nonlinear equation of state. *J. Phys. Oceanogr.* **41**, 28–41.

65. Döös, K., Nilsson, J., **Nycander, J.**, Brodeau, L. and Ballarotta, M., 2012. The world ocean thermohaline circulation. *J. Phys. Oceanogr.* **42**, 1445–1460.
66. Thompson, B., Jakobsson, M., Nilsson, J., **Nycander, J.** and Döös, K., 2012. A model study of the first ventilated regime of the Arctic Ocean during early Miocene. *Polar Research* **31**, 10859.
67. Bahrami, F., Taghvafard, H., **Nycander, J.** and Mohammadi, A., 2013. Stability investigation for steady solutions of the barotropic vorticity equation in R-2. *Commun. Nonlinear. Sci. Numer. Simulat.* **18**, 541–546.
68. Green, J.A.M. and **Nycander, J.**, 2013. A comparison of tidal conversion parameterizations for tidal models. *J. Phys. Oceanogr.* **43**, 104–119.
69. Hieronymus, M. and **Nycander, J.**, 2013. The buoyancy budget with a nonlinear equation of state. *J. Phys. Oceanogr.* **43**, 176–186.
70. Claesson, J. and **Nycander, J.**, 2013. Combined effect of global warming and increased CO₂-concentration on vegetation growth in water-limited conditions. *Ecological Modelling*, **256**, 23–30.
71. Hieronymus, M. and **Nycander, J.**, 2013. The budgets for heat and salinity in NEMO. *Ocean Modell.* **67**, 28–38.
72. Melet, A., Nikurashin, M., Muller, C., Falahat, S., **Nycander, J.**, Timko, P.G., Arbic, B.K. and Goff, J.A., 2013. Internal tide generation by abyssal hills using analytical theory. *J. Geophys. Res.* **118**, 6303–6318.
73. Thompson, B., **Nycander, J.**, Nilsson, J., Jakobsson, M. and Döös, K. 2014. Estimating ventilation time scales using overturning stream functions. *Ocean Dyn.* **64**, 797–807.
74. Hieronymus, M., Nilsson, J. and **Nycander, J.**, 2014. Water mass transformation in salinity-temperature space. *J. Phys. Oceanogr.* **44**, 2547–2568.
75. Falahat, S., **Nycander, J.**, Roquet, F. and Zarroug, M., 2014. Global calculation of tidal energy conversion into vertical normal modes. *J. Phys. Oceanogr.* **44**, 3225–3244.

76. Falahat, S., **Nycander, J.**, Roquet, F., Thurnherr, A. and Hibiya, T., 2014. Comparison of calculated energy flux of internal tides with microstructure measurements. *Tellus* **66A**, 23240.
77. Walin, G., Hieronymus, J. and **Nycander, J.**, 2014. Source-related variables for the description of the oceanic carbon system. *Geochem. Geophys. Geosyst.* **15**, 3675–3687.
78. Roquet, F., Madec, G., Brodeau, L. and **Nycander, J.**, 2015. Defining a simplified yet ‘realistic’ equation of state for seawater. *J. Phys. Oceanogr.* **45**, 2564–2579.
79. Falahat, S. and **Nycander, J.**, 2015. On the generation of bottom-trapped internal tides. *J. Phys. Oceanogr.* **45**, 526–545.
80. Heifetz, E., Mak, J., **Nycander, J.** and Umurhan, O.M., 2015. Interacting vorticity waves as an instability mechanism for magnetohydrodynamic shear instabilities. *J. Fluid Mech.* **767**, 199–225.
81. Hieronymus, M. and **Nycander, J.**, 2015. Finding the minimum potential energy state by adiabatic parcel rearrangements with a nonlinear equation of state: an exact solution in polynomial time. *J. Phys. Oceanogr.* **45**, 1843–1857.
82. **Nycander, J.**, Hieronymus, M. and Roquet, F., 2015. The nonlinear equation of state of sea water and the global water mass distribution. *Geophys. Res. Lett.* **42**, 7714–7721.
83. Hassler, J., Krusell, J. and **Nycander, J.**, 2016. Climate policy. *Economic Policy* **31**, 503–558.
84. Fransner, F., **Nycander, J.**, Mörth, C.-M., Humborg, C., Meier, M., Hordoir, R., Gustafsson, E. and Deutsch, B., 2016. Tracing terrestrial DOC in the Baltic Sea – a 3-D model study. *Global Biogeochem. Cycles* **30**, 134–148.
85. Berglund, S., Döös, K. and **Nycander, J.**, 2017. Lagrangian tracing of the water-mass transformations in the Atlantic Ocean. *Tellus* **69A**, 1306311.

86. Brannigan, L., Johnson, H., Lique, C., **Nycander, J.** and Nilsson, J., 2017. Generation of Subsurface Anticyclones at Arctic Surface Fronts due to a Surface Stress. *J. Phys. Oceanogr.* **47**, 2653–2671.
87. Fransner, F., Gustafsson, E., Tedesco, L., Vichi, M., Hordoir, R., Roquet, F., Spilling, K., Kuznetsov, I., Eilola, K., Mört, C.-M., Humborg, C. and **Nycander, J.** 2018. Non-Redfieldian Dynamics Explain Seasonal pCO₂ Drawdown in the Gulf of Bothnia. *J. Geophys. Res.: Oceans* **123**, 10.1002/2017JC013019.
88. Ödalen, M., **Nycander, J.**, Oliver, K.I.C., Brodeau, L. and Ridgwell, A., 2018. The influence of the ocean circulation state on ocean carbon storage and CO₂ drawdown potential in an Earth system model. *Biogeosciences* **15**, 1367–1393.
89. Hieronymus, M., **Nycander, J.**, Nilsson, J., Döös, K. and Hallberg, R., 2019. Oceanic overturning and heat transport: The role of background diffusivity. *J. Climate*, **32**, 701–716.
90. Fransner, F., Fransson, A., Humborg, C., Gustafsson, E., Tedesco, L., Hordoir, R. and **Nycander, J.** 2019. Remineralization rate of terrestrial DOC as inferred from CO₂ supersaturated coastal waters. *Biogeosciences* **15**, 863–879.
91. Pollmann, F., **Nycander, J.**, Eden, C. and Olbers, D., 2019. Resolving the horizontal direction of internal tide generation. *J. Fluid Mech.* **864**, 381–407.
92. de Lavergne, C., Falahat, S., Madec, G., Roquet, F., **Nycander, J.** and Vic, C. 2019. Toward global maps of internal tide energy sinks. *Ocean Modell.* **137**, 52–75.
93. Hieronymus, M. and **Nycander, J.**, 2020. Interannual variability of the overturning and energy transport in the atmosphere and ocean during the late twentieth century with implications for precipitation and sea level. *J. Climate* **33**, 317–338.
94. Ödalen, M., **Nycander, J.**, Ridgwell, A., Oliver, K.I.C., Peterson, C.D. and Nilsson, J., 2020. Variable C/P composition of organic production and its effect on ocean carbon storage in glacial-like model simulations. *Biogeosciences* **17**, 2219–2244.

95. Ruggieri, P., Ambaum, M.H.P. and **Nycander, J.**, 2020. Thermodynamic cycles in the stratosphere. *J. Atoms. Sci.* **77**, 1897–1912.
96. Aldama-Campino, A., Fransner, F., Ödalen, M., Groeskamp, S., Yool, A., Döös, K. and **Nycander, J.**, 2020. Meridional ocean carbon transport. *Global Biogeochem. Cycles* **34**, e2019GB006336, doi:10.1029/2019GB006336.
97. Bordois, L., **Nycander, J.** and Paci, A., 2020. Computation of density perturbation and energy flux of internal waves from experimental data. *Fluids* **5**, 119, doi:10.3390/fluids5030119.
98. Sutyrin, G. G., Radko, T. and **Nycander, J.**, 2021. Steady radiating baroclinic vortices in vertically sheared flows. *Phys. Fluids* **33**, 031705, doi:10.1063/5.0040298.