

# Index

## A

Asymptotically stable equilibrium	63
Asymptotically unstable equilibrium	63
Autonomous dynamical systems	56
Autonomous linear system	1
Autonomous nonlinear system	56, 109

## B

Bifurcation	70, 95
Bifurcation point	70
Bifurcation value	70

## C

Center	25, 28, 65
Center subspace	24, 59
Center manifold	61
Complex eigenvalues	3, 59
Continuous dynamical system	55
Critical point	58

## D

Decreasing saddle	78, 84
Degenerate switching	72
Differentiable manifold	58
Duffing oscillator	135, 204, 262
Dynamical system	55

## E

Eigenspace	23, 24, 59
Energy increment	201
Energy spectrum	250
Energy incremental spectrum	262
Equilibrium	58
Equilibrium point	58

## F

First integral manifolds	168
First integral quantity increment	201
Flow	55
Free vibration systems	121

## G

G-functions	181, 191
Global flow	171, 178, 182
Global stable manifold	60
Global tangency	184, 189
Global tangential flow	194
Global transversality	176, 193
Global unstable manifold	60
Grazing bifurcation	192

## H

Hamiltonian system	192, 196, 237
Homogenous linear system	1
Hopf switching	72, 76
Hyperbolic bifurcation	96
Hyperbolic point	28
Hyperbolic equilibrium	64
Hopf bifurcation	75, 103, 128
Hopf switching	75, 76

## I

Increasing saddle	78, 84
Initial sets of global flow	174
Initial sets of local flow	174
Invariant subspace	23, 59
$C^r$ invariant manifold	60, 61

## J

Jacobian matrix	57
-----------------	----

<b>L</b>		Saddle-saddle switching	74
Layer dynamics	252	Saddle-node bifurcation	74,97
Layer width	250	Separatrix	172
Linear system with distinct eigenvalues	1	Separatrix manifold	169
Linear system with repeated eigenvalues	9	Separatrix map	243
Linear system with periodic coefficients	21	Separatrix surface	169
Linearized system	59	Sink	25,28,64
Lipschitz condition	57	Source	26,27,64
Local flow	171	Spatial derivative	56
Local invariant space	62	Spiral sink	27,28,69
Local stable invariant manifold	61	Spiral source	27,28,69
Local stable manifold	60	Spiral saddle	28,69
Local unstable invariant manifod	61	Spirally stable equilibrium	64
Local unstable manifold	61	Spirally unstable equilibrium	64
Lyapunov function	106	Standard mapping	249
		Stable bifurcation	72
		Stable equilibrium	63
<b>M</b>		Stable Hopf bifurcation	72,75
Manifold	58	Stable Hopf switching	72,75
		Stable node	27,62
		Stable saddle-node bifurcation	74
		Stable saddle-node switching	74
<b>N</b>		Stable subspace	23,24,59
		Stability	22,58
Nonautonomous dynamical systems	56	Stability boundary	22
Nonautonomous linear systems	1	Stochastic layer	238
Nonhomogenous linear system	1,18	Switching	70,71
Nonlinear vibration systems	121	Switching points	70
Nonlinear dynamical system	55, 167	Switching values	70
<b>O</b>		<b>T</b>	
Operator exponential	7	Trajectory	56
Operator norm	7	Transcritical bifurcation	97
<b>P</b>		<b>U</b>	
Periodic flow	109	Uncoupled linear homogeneous systems	2
pitchfork bifurcation	98	Unstable equilibrium	62
Periodically forced nonlinear systems	117	Unstable bifurcation	72
Periodically forced vibration systems	131	Unstable Hopf bifurcation	72,75
		Unstable node	26,65
		Unstable saddle-node bifurcation	74,96
		Unstable subspace	23,24,59
<b>R</b>		<b>V</b>	
Resonant separatrix layers	250	Vector field	55
<b>S</b>		Velocity vector	55
Saddle	28,64		



**L&H Scientific**

<https://lhscientificpublishing.com/Books/MMMCP-CDS.aspx>

Continuous Dynamical Systems

Luo, A.C.J.

2012, 286p. 86 illus., Hardcover

ISBN 978-1-62155-000-6