DeepONet:

`100%|████████████| 60/60 [00:05<00:00, 11.11it/s]`

Epoch 1/60 | Base: 0.057419 Lap: 0.047972 Edge: 0.051795 | SpecLow: 1.090762 SpecHigh: 2.267060 | Data: 0.431616 Phys: 0.000000 Total: 0.431616 | LR=0.0002 GradNorm=0.918 NegDet=0.000 | Val: Data=0.380506 Phys=0.000000 Total=0.380506 NegDet=0.000 | Sched(Wlow=0.200, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.30) | Time: 6.01s

`100%|████████████| 60/60 [00:04<00:00, 13.70it/s]`

Epoch 2/60 | Base: 0.048517 Lap: 0.038482 Edge: 0.043660 | SpecLow: 0.864882 SpecHigh: 1.520739 | Data: 0.328562 Phys: 0.000000 Total: 0.328562 | LR=0.0004 GradNorm=0.407 NegDet=0.000 | Val: Data=0.322254 Phys=0.000000 Total=0.322254 NegDet=0.000 | Sched(Wlow=0.199, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.32) | Time: 4.64s

`100%|████████████| 60/60 [00:04<00:00, 13.79it/s]`

Epoch 3/60 | Base: 0.041339 Lap: 0.035009 Edge: 0.036778 | SpecLow: 0.703300 SpecHigh: 1.290946 | Data: 0.272448 Phys: 0.000000 Total: 0.272448 | LR=0.0006 GradNorm=0.252 NegDet=0.000 | Val: Data=0.298820 Phys=0.000000 Total=0.298820 NegDet=0.000 | Sched(Wlow=0.198, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.34) | Time: 4.63s

`100%|████████████| 60/60 [00:04<00:00, 13.74it/s]`

Epoch 4/60 | Base: 0.038369 Lap: 0.032872 Edge: 0.034028 | SpecLow: 0.674116 SpecHigh: 1.153214 | Data: 0.253352 Phys: 0.000000 Total: 0.253352 | LR=0.0008 GradNorm=0.171 NegDet=0.000 | Val: Data=0.288100 Phys=0.000000 Total=0.288100 NegDet=0.000 | Sched(Wlow=0.196, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.37) | Time: 4.64s

`100%|████████████| 60/60 [00:04<00:00, 13.66it/s]`

Epoch 5/60 | Base: 0.037036 Lap: 0.031828 Edge: 0.032804 | SpecLow: 0.660076 SpecHigh: 1.095287 | Data: 0.243983 Phys: 0.000000 Total: 0.243983 | LR=0.001 GradNorm=0.124 NegDet=0.000 | Val: Data=0.282972 Phys=0.000000 Total=0.282972 NegDet=0.000 | Sched(Wlow=0.194, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.40) | Time: 4.67s

`100%|████████████| 60/60 [00:04<00:00, 13.66it/s]`

Epoch 6/60 | Base: 0.036253 Lap: 0.031226 Edge: 0.032088 | SpecLow: 0.652942 SpecHigh: 1.061929 | Data: 0.237945 Phys: 0.000000 Total: 0.237945 | LR=0.00099925 GradNorm=0.091 NegDet=0.000 | Val: Data=0.273858 Phys=0.000000 Total=0.273858 NegDet=0.000 | Sched(Wlow=0.192, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.45) | Time: 4.65s

`100%|████████████| 60/60 [00:04<00:00, 13.41it/s]`

Epoch 7/60 | Base: 0.035735 Lap: 0.030874 Edge: 0.031606 | SpecLow: 0.644712 SpecHigh: 1.044211 | Data: 0.232775 Phys: 0.000000 Total: 0.232775 | LR=0.000997 GradNorm=0.074 NegDet=0.000 | Val: Data=0.273212 Phys=0.000000 Total=0.273212 NegDet=0.000 | Sched(Wlow=0.189, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.49) | Time: 4.75s

100%|███████████| 60/60 [00:04<00:00, 13.97it/s]

Epoch 8/60 | Base: 0.035512 Lap: 0.030694 Edge: 0.031403 | SpecLow: 0.640006 SpecHigh: 1.035226 | Data: 0.228970 Phys: 0.000000 Total: 0.228970 | LR=0.00099326 GradNorm=0.065 NegDet=0.000 | Val: Data=0.267285 Phys=0.000000 Total=0.267285 NegDet=0.000 | Sched(Wlow=0.186, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.55) | Time: 4.57s

100%|███████████| 60/60 [00:04<00:00, 13.53it/s]

Epoch 9/60 | Base: 0.035283 Lap: 0.030591 Edge: 0.031187 | SpecLow: 0.630321 SpecHigh: 1.030653 | Data: 0.224326 Phys: 0.000000 Total: 0.224326 | LR=0.00098805 GradNorm=0.055 NegDet=0.000 | Val: Data=0.265722 Phys=0.000000 Total=0.265722 NegDet=0.000 | Sched(Wlow=0.182, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.60) | Time: 4.71s

100%|███████████| 60/60 [00:04<00:00, 13.93it/s]

Epoch 10/60 | Base: 0.035154 Lap: 0.030538 Edge: 0.031065 | SpecLow: 0.627336 SpecHigh: 1.028057 | Data: 0.220976 Phys: 0.000000 Total: 0.220976 | LR=0.00098137 GradNorm=0.052 NegDet=0.000 | Val: Data=0.259305 Phys=0.000000 Total=0.259305 NegDet=0.000 | Sched(Wlow=0.178, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.66) | Time: 4.59s

100%|███████████| 60/60 [00:04<00:00, 13.76it/s]

Epoch 11/60 | Base: 0.035024 Lap: 0.030518 Edge: 0.030939 | SpecLow: 0.620793 SpecHigh: 1.027177 | Data: 0.216936 Phys: 0.000000 Total: 0.216936 | LR=0.00097325 GradNorm=0.047 NegDet=0.000 | Val: Data=0.257232 Phys=0.000000 Total=0.257232 NegDet=0.000 | Sched(Wlow=0.174, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.71) | Time: 4.64s

100%|███████████| 60/60 [00:04<00:00, 13.89it/s]

Epoch 12/60 | Base: 0.034877 Lap: 0.030537 Edge: 0.030795 | SpecLow: 0.612105 SpecHigh: 1.028012 | Data: 0.212496 Phys: 0.000000 Total: 0.212496 | LR=0.00096372 GradNorm=0.042 NegDet=0.000 | Val: Data=0.252700 Phys=0.000000 Total=0.252700 NegDet=0.000 | Sched(Wlow=0.169, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.76) | Time: 4.58s

100%|███████████| 60/60 [00:04<00:00, 13.91it/s]

Epoch 13/60 | Base: 0.034725 Lap: 0.030586 Edge: 0.030643 | SpecLow: 0.604321 SpecHigh: 1.030335 | Data: 0.208209 Phys: 0.000000 Total: 0.208209 | LR=0.0009528 GradNorm=0.039 NegDet=0.000 | Val: Data=0.247543 Phys=0.000000 Total=0.247543 NegDet=0.000 |

Sched(Wlow=0.165, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.82) | Time: 4.59s

100%|███████████| 60/60 [00:04<00:00, 13.57it/s]

Epoch 14/60 | Base: 0.034527 Lap: 0.030678 Edge: 0.030444 | SpecLow: 0.591447 SpecHigh: 1.034962 | Data: 0.203135 Phys: 0.000000 Total: 0.203135 | LR=0.00094054 GradNorm=0.034 NegDet=0.000 | Val: Data=0.242590 Phys=0.000000 Total=0.242590 NegDet=0.000 | Sched(Wlow=0.159, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.86) | Time: 4.68s

100%|███████████| 60/60 [00:04<00:00, 13.77it/s]

Epoch 15/60 | Base: 0.034244 Lap: 0.030821 Edge: 0.030155 | SpecLow: 0.572799 SpecHigh: 1.042868 | Data: 0.197284 Phys: 0.000000 Total: 0.197284 | LR=0.00092698 GradNorm=0.034 NegDet=0.000 | Val: Data=0.237570 Phys=0.000000 Total=0.237570 NegDet=0.000 | Sched(Wlow=0.154, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.90) | Time: 4.62s
Checkpoint saved at epoch 15 (25% complete)

100%|███████████| 60/60 [00:04<00:00, 13.55it/s]

Epoch 16/60 | Base: 0.033918 Lap: 0.031009 Edge: 0.029815 | SpecLow: 0.550090 SpecHigh: 1.053990 | Data: 0.191078 Phys: 0.000000 Total: 0.191078 | LR=0.00091215 GradNorm=0.036 NegDet=0.000 | Val: Data=0.232283 Phys=0.000000 Total=0.232283 NegDet=0.000 | Sched(Wlow=0.149, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.94) | Time: 4.69s

100%|███████████| 60/60 [00:04<00:00, 13.73it/s]

Epoch 17/60 | Base: 0.033434 Lap: 0.031186 Edge: 0.029317 | SpecLow: 0.518315 SpecHigh: 1.066864 | Data: 0.183663 Phys: 0.000000 Total: 0.183663 | LR=0.00089611 GradNorm=0.040 NegDet=0.000 | Val: Data=0.225682 Phys=0.000000 Total=0.225682 NegDet=0.000 | Sched(Wlow=0.143, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.97) | Time: 4.60s

100%|███████████| 60/60 [00:04<00:00, 13.73it/s]

Epoch 18/60 | Base: 0.032914 Lap: 0.031284 Edge: 0.028784 | SpecLow: 0.481620 SpecHigh: 1.076578 | Data: 0.175627 Phys: 0.000000 Total: 0.175627 | LR=0.0008789 GradNorm=0.051 NegDet=0.000 | Val: Data=0.220527 Phys=0.000000 Total=0.220527 NegDet=0.000 | Sched(Wlow=0.137, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.99) | Time: 4.63s

100%|███████████| 60/60 [00:04<00:00, 13.66it/s]

Epoch 19/60 | Base: 0.032400 Lap: 0.031226 Edge: 0.028276 | SpecLow: 0.449980 SpecHigh: 1.076911 | Data: 0.168063 Phys: 0.000000 Total: 0.168063 | LR=0.00086059 GradNorm=0.064 NegDet=0.000 | Val: Data=0.213612 Phys=0.000000 Total=0.213612 NegDet=0.000 | Sched(Wlow=0.131, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 4.65s

100%|████████████| 60/60 [00:04<00:00, 13.59it/s]

Epoch 20/60 | Base: 0.032068 Lap: 0.031064 Edge: 0.027964 | SpecLow: 0.426890 SpecHigh: 1.069440 | Data: 0.161655 Phys: 0.000000 Total: 0.161655 | LR=0.00084124 GradNorm=0.087 NegDet=0.000 | Val: Data=0.208609 Phys=0.000000 Total=0.208609 NegDet=0.000 | Sched(Wlow=0.126, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 4.67s

100%|████████████| 60/60 [00:04<00:00, 14.02it/s]

Epoch 21/60 | Base: 0.031844 Lap: 0.030878 Edge: 0.027767 | SpecLow: 0.410265 SpecHigh: 1.059813 | Data: 0.156289 Phys: 0.000000 Total: 0.156289 | LR=0.0008209 GradNorm=0.100 NegDet=0.000 | Val: Data=0.202591 Phys=0.000000 Total=0.202591 NegDet=0.000 | Sched(Wlow=0.120, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 4.56s

100%|████████████| 60/60 [00:04<00:00, 13.60it/s]

Epoch 22/60 | Base: 0.032034 Lap: 0.030705 Edge: 0.027976 | SpecLow: 0.401178 SpecHigh: 1.049385 | Data: 0.152443 Phys: 0.000000 Total: 0.152443 | LR=0.00079964 GradNorm=0.120 NegDet=0.000 | Val: Data=0.198499 Phys=0.000000 Total=0.198499 NegDet=0.000 | Sched(Wlow=0.114, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 4.65s

100%|████████████| 60/60 [00:04<00:00, 13.94it/s]

Epoch 23/60 | Base: 0.032056 Lap: 0.030566 Edge: 0.028017 | SpecLow: 0.395048 SpecHigh: 1.041328 | Data: 0.148993 Phys: 0.000000 Total: 0.148993 | LR=0.00077754 GradNorm=0.117 NegDet=0.000 | Val: Data=0.192630 Phys=0.000000 Total=0.192630 NegDet=0.000 | Sched(Wlow=0.108, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 4.56s

100%|████████████| 60/60 [00:04<00:00, 13.61it/s]

Epoch 24/60 | Base: 0.031929 Lap: 0.030440 Edge: 0.027906 | SpecLow: 0.389297 SpecHigh: 1.034856 | Data: 0.145606 Phys: 0.000000 Total: 0.145606 | LR=0.00075467 GradNorm=0.116 NegDet=0.000 | Val: Data=0.188196 Phys=0.000000 Total=0.188196 NegDet=0.000 | Sched(Wlow=0.102, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 4.67s

100%|████████████| 60/60 [00:04<00:00, 13.71it/s]

Epoch 25/60 | Base: 0.031612 Lap: 0.030373 Edge: 0.027603 | SpecLow: 0.383322 SpecHigh: 1.032010 | Data: 0.142315 Phys: 0.000000 Total: 0.142315 | LR=0.00073109 GradNorm=0.104 NegDet=0.000 | Val: Data=0.183759 Phys=0.000000 Total=0.183759 NegDet=0.000 | Sched(Wlow=0.097, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 4.64s

100%|████████████| 60/60 [00:04<00:00, 13.76it/s]

Epoch 26/60 | Base: 0.031281 Lap: 0.030245 Edge: 0.027282 | SpecLow: 0.378451 SpecHigh: 1.026638 | Data: 0.139073 Phys: 0.000000 Total: 0.139073 | LR=0.00070689 GradNorm=0.083

NegDet=0.000 | Val: Data=0.179892 Phys=0.000000 Total=0.179892 NegDet=0.000 |
Sched(Wlow=0.092, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10,
Wphys=1.00) | Time: 4.62s

100%| | 60/60 [00:04<00:00, 13.79it/s]

Epoch 27/60 | Base: 0.030988 Lap: 0.030169 Edge: 0.026998 | SpecLow: 0.373086 SpecHigh:
1.023706 | Data: 0.136119 Phys: 0.000000 Total: 0.136119 | LR=0.00068215 GradNorm=0.071
NegDet=0.000 | Val: Data=0.175319 Phys=0.000000 Total=0.175319 NegDet=0.000 |
Sched(Wlow=0.086, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.11,
Wphys=1.00) | Time: 4.58s

100%| | 60/60 [00:04<00:00, 13.75it/s]

Epoch 28/60 | Base: 0.030704 Lap: 0.030104 Edge: 0.026721 | SpecLow: 0.366758 SpecHigh:
1.021476 | Data: 0.133283 Phys: 0.000000 Total: 0.133283 | LR=0.00065694 GradNorm=0.057
NegDet=0.000 | Val: Data=0.171844 Phys=0.000000 Total=0.171844 NegDet=0.000 |
Sched(Wlow=0.082, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.11,
Wphys=1.00) | Time: 4.62s

100%| | 60/60 [00:04<00:00, 13.86it/s]

Epoch 29/60 | Base: 0.030499 Lap: 0.030062 Edge: 0.026523 | SpecLow: 0.363483 SpecHigh:
1.019775 | Data: 0.130972 Phys: 0.000000 Total: 0.130972 | LR=0.00063135 GradNorm=0.045
NegDet=0.000 | Val: Data=0.168103 Phys=0.000000 Total=0.168103 NegDet=0.000 |
Sched(Wlow=0.077, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.12,
Wphys=1.00) | Time: 4.58s

100%| | 60/60 [00:04<00:00, 13.80it/s]

Epoch 30/60 | Base: 0.030357 Lap: 0.030031 Edge: 0.026386 | SpecLow: 0.359735 SpecHigh:
1.018593 | Data: 0.128871 Phys: 0.000000 Total: 0.128871 | LR=0.00060546 GradNorm=0.037
NegDet=0.000 | Val: Data=0.164721 Phys=0.000000 Total=0.164721 NegDet=0.000 |
Sched(Wlow=0.073, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.13,
Wphys=1.00) | Time: 4.58s
Checkpoint saved at epoch 30 (50% complete)

100%| | 60/60 [00:04<00:00, 13.83it/s]

Epoch 31/60 | Base: 0.030258 Lap: 0.030004 Edge: 0.026286 | SpecLow: 0.356822 SpecHigh:
1.017574 | Data: 0.128130 Phys: 0.000000 Total: 0.128130 | LR=0.00057936 GradNorm=0.030
NegDet=0.000 | Val: Data=0.162821 Phys=0.000000 Total=0.162821 NegDet=0.000 |
Sched(Wlow=0.069, Whigh=0.061, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.14,
Wphys=1.00) | Time: 4.57s

100%| | 60/60 [00:04<00:00, 13.90it/s]

Epoch 32/60 | Base: 0.030199 Lap: 0.029987 Edge: 0.026216 | SpecLow: 0.354605 SpecHigh:
1.016955 | Data: 0.129823 Phys: 0.000000 Total: 0.129823 | LR=0.00055314 GradNorm=0.025
NegDet=0.000 | Val: Data=0.163337 Phys=0.000000 Total=0.163337 NegDet=0.000 |
Sched(Wlow=0.065, Whigh=0.064, pH=1.22, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.15,
Wphys=1.00) | Time: 4.58s

100%|███████████| 60/60 [00:04<00:00, 13.79it/s]

Epoch 33/60 | Base: 0.030161 Lap: 0.029967 Edge: 0.026159 | SpecLow: 0.351993 SpecHigh: 1.016520 | Data: 0.133808 Phys: 0.000000 Total: 0.133808 | LR=0.00052686 GradNorm=0.022 NegDet=0.000 | Val: Data=0.166348 Phys=0.000000 Total=0.166348 NegDet=0.000 | Sched(Wlow=0.062, Whigh=0.070, pH=1.24, Wg=0.61, Wlap=0.20, Wedge=0.20, ROI=0.17, Wphys=1.00) | Time: 4.58s

100%|███████████| 60/60 [00:04<00:00, 13.91it/s]

Epoch 34/60 | Base: 0.030151 Lap: 0.029950 Edge: 0.026120 | SpecLow: 0.352050 SpecHigh: 1.015999 | Data: 0.140199 Phys: 0.000000 Total: 0.140199 | LR=0.00050064 GradNorm=0.020 NegDet=0.000 | Val: Data=0.171688 Phys=0.000000 Total=0.171688 NegDet=0.000 | Sched(Wlow=0.059, Whigh=0.077, pH=1.28, Wg=0.61, Wlap=0.20, Wedge=0.20, ROI=0.18, Wphys=1.00) | Time: 4.60s

100%|███████████| 60/60 [00:04<00:00, 13.79it/s]

Epoch 35/60 | Base: 0.030154 Lap: 0.029927 Edge: 0.026087 | SpecLow: 0.349377 SpecHigh: 1.015631 | Data: 0.148592 Phys: 0.000000 Total: 0.148592 | LR=0.00047454 GradNorm=0.020 NegDet=0.000 | Val: Data=0.179348 Phys=0.000000 Total=0.179348 NegDet=0.000 | Sched(Wlow=0.056, Whigh=0.086, pH=1.32, Wg=0.62, Wlap=0.21, Wedge=0.20, ROI=0.20, Wphys=1.00) | Time: 4.59s

100%|███████████| 60/60 [00:04<00:00, 13.63it/s]

Epoch 36/60 | Base: 0.030169 Lap: 0.029904 Edge: 0.026057 | SpecLow: 0.348119 SpecHigh: 1.015025 | Data: 0.159092 Phys: 0.000000 Total: 0.159092 | LR=0.00044865 GradNorm=0.020 NegDet=0.000 | Val: Data=0.189244 Phys=0.000000 Total=0.189244 NegDet=0.000 | Sched(Wlow=0.054, Whigh=0.097, pH=1.37, Wg=0.62, Wlap=0.21, Wedge=0.20, ROI=0.21, Wphys=1.00) | Time: 4.64s
Early stopping at epoch 36

PINN:
100%|████████████| 60/60 [00:19<00:00, 3.07it/s]

Epoch 1/60 | Base: 0.159118 Lap: 0.355874 Edge: 0.137300 | SpecLow: 3.610861 SpecHigh: 313.412206 | Data: 19.785622 Phys: 0.000000 Total: 19.785622 | LR=0.0002 GradNorm=255.391 NegDet=0.000 | Val: Data=4.640830 Phys=0.000000 Total=4.640830 NegDet=0.000 | Sched(Wlow=0.200, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.30) | Time: 20.80s

100%|████████████| 60/60 [00:18<00:00, 3.19it/s]

Epoch 2/60 | Base: 0.113818 Lap: 0.172062 Edge: 0.102356 | SpecLow: 1.329519 SpecHigh: 50.664782 | Data: 3.474947 Phys: 0.000000 Total: 3.474947 | LR=0.0004 GradNorm=34.685 NegDet=0.000 | Val: Data=2.853955 Phys=0.000000 Total=2.853955 NegDet=0.000 | Sched(Wlow=0.199, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.32) | Time: 19.39s

100%|████████████| 60/60 [00:18<00:00, 3.20it/s]

Epoch 3/60 | Base: 0.101594 Lap: 0.139764 Edge: 0.091793 | SpecLow: 1.141837 SpecHigh: 33.763657 | Data: 2.401057 Phys: 0.000000 Total: 2.401057 | LR=0.0006 GradNorm=19.546 NegDet=0.000 | Val: Data=1.936450 Phys=0.000000 Total=1.936450 NegDet=0.000 | Sched(Wlow=0.198, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.34) | Time: 19.33s

100%|████████████| 60/60 [00:18<00:00, 3.19it/s]

Epoch 4/60 | Base: 0.087295 Lap: 0.119567 Edge: 0.079058 | SpecLow: 0.999558 SpecHigh: 21.713973 | Data: 1.627190 Phys: 0.000000 Total: 1.627190 | LR=0.0008 GradNorm=9.390 NegDet=0.000 | Val: Data=1.331469 Phys=0.000000 Total=1.331469 NegDet=0.000 | Sched(Wlow=0.196, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.37) | Time: 19.36s

100%|████████████| 60/60 [00:18<00:00, 3.21it/s]

Epoch 5/60 | Base: 0.076371 Lap: 0.102202 Edge: 0.069252 | SpecLow: 0.832455 SpecHigh: 14.176904 | Data: 1.123888 Phys: 0.000000 Total: 1.123888 | LR=0.001 GradNorm=5.483 NegDet=0.000 | Val: Data=0.906593 Phys=0.000000 Total=0.906593 NegDet=0.000 | Sched(Wlow=0.194, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.40) | Time: 19.21s

100%|████████████| 60/60 [00:18<00:00, 3.22it/s]

Epoch 6/60 | Base: 0.059247 Lap: 0.090167 Edge: 0.053049 | SpecLow: 0.719227 SpecHigh: 9.426896 | Data: 0.791913 Phys: 0.000000 Total: 0.791913 | LR=0.00099925 GradNorm=3.222 NegDet=0.000 | Val: Data=0.680030 Phys=0.000000 Total=0.680030 NegDet=0.000 | Sched(Wlow=0.192, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.45) | Time: 19.14s

100%|████████████| 60/60 [00:18<00:00, 3.22it/s]

Epoch 7/60 | Base: 0.045588 Lap: 0.079829 Edge: 0.039982 | SpecLow: 0.585496 SpecHigh: 6.980217 | Data: 0.599158 Phys: 0.000000 Total: 0.599158 | LR=0.000997 GradNorm=2.390 NegDet=0.000 | Val: Data=0.519326 Phys=0.000000 Total=0.519326 NegDet=0.000 | Sched(Wlow=0.189, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.49) | Time: 19.19s

100%|████████████| 60/60 [00:18<00:00, 3.22it/s]

Epoch 8/60 | Base: 0.039418 Lap: 0.070352 Edge: 0.034278 | SpecLow: 0.430550 SpecHigh: 5.335244 | Data: 0.460518 Phys: 0.000000 Total: 0.460518 | LR=0.00099326 GradNorm=1.713 NegDet=0.000 | Val: Data=0.398804 Phys=0.000000 Total=0.398804 NegDet=0.000 | Sched(Wlow=0.186, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.55) | Time: 19.17s

100%|████████████| 60/60 [00:18<00:00, 3.24it/s]

Epoch 9/60 | Base: 0.035734 Lap: 0.064379 Edge: 0.030936 | SpecLow: 0.296150 SpecHigh: 4.211337 | Data: 0.361488 Phys: 0.000000 Total: 0.361488 | LR=0.00098805 GradNorm=1.457 NegDet=0.000 | Val: Data=0.322163 Phys=0.000000 Total=0.322163 NegDet=0.000 | Sched(Wlow=0.182, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.60) | Time: 19.03s

100%|████████████| 60/60 [00:18<00:00, 3.22it/s]

Epoch 10/60 | Base: 0.034105 Lap: 0.057636 Edge: 0.029550 | SpecLow: 0.254357 SpecHigh: 3.236343 | Data: 0.291115 Phys: 0.000000 Total: 0.291115 | LR=0.00098137 GradNorm=1.167 NegDet=0.000 | Val: Data=0.260446 Phys=0.000000 Total=0.260446 NegDet=0.000 | Sched(Wlow=0.178, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.66) | Time: 19.17s

100%|████████████| 60/60 [00:18<00:00, 3.21it/s]

Epoch 11/60 | Base: 0.033839 Lap: 0.051318 Edge: 0.029449 | SpecLow: 0.249387 SpecHigh: 2.420519 | Data: 0.238672 Phys: 0.000000 Total: 0.238672 | LR=0.00097325 GradNorm=0.940 NegDet=0.000 | Val: Data=0.214540 Phys=0.000000 Total=0.214540 NegDet=0.000 | Sched(Wlow=0.174, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.71) | Time: 19.25s

100%|████████████| 60/60 [00:18<00:00, 3.20it/s]

Epoch 12/60 | Base: 0.031626 Lap: 0.046685 Edge: 0.027375 | SpecLow: 0.224430 SpecHigh: 1.888171 | Data: 0.197788 Phys: 0.000000 Total: 0.197788 | LR=0.00096372 GradNorm=0.695 NegDet=0.000 | Val: Data=0.184783 Phys=0.000000 Total=0.184783 NegDet=0.000 | Sched(Wlow=0.169, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.76) | Time: 19.32s

100%|████████████| 60/60 [00:18<00:00, 3.19it/s]

Epoch 13/60 | Base: 0.029192 Lap: 0.043857 Edge: 0.025076 | SpecLow: 0.203530 SpecHigh: 1.631395 | Data: 0.174370 Phys: 0.000000 Total: 0.174370 | LR=0.0009528 GradNorm=0.505 NegDet=0.000 | Val: Data=0.167200 Phys=0.000000 Total=0.167200 NegDet=0.000 |

Sched(Wlow=0.165, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.82) | Time: 19.33s

100%|████████████| 60/60 [00:18<00:00, 3.21it/s]

Epoch 14/60 | Base: 0.027925 Lap: 0.042040 Edge: 0.023915 | SpecLow: 0.195915 SpecHigh: 1.493423 | Data: 0.161968 Phys: 0.000000 Total: 0.161968 | LR=0.00094054 GradNorm=0.529 NegDet=0.000 | Val: Data=0.157805 Phys=0.000000 Total=0.157805 NegDet=0.000 | Sched(Wlow=0.159, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.86) | Time: 19.20s

100%|████████████| 60/60 [00:18<00:00, 3.17it/s]

Epoch 15/60 | Base: 0.026775 Lap: 0.040872 Edge: 0.022848 | SpecLow: 0.183796 SpecHigh: 1.403736 | Data: 0.152076 Phys: 0.000000 Total: 0.152076 | LR=0.00092698 GradNorm=0.450 NegDet=0.000 | Val: Data=0.151026 Phys=0.000000 Total=0.151026 NegDet=0.000 | Sched(Wlow=0.154, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.90) | Time: 19.51s
Checkpoint saved at epoch 15 (25% complete)

100%|████████████| 60/60 [00:18<00:00, 3.24it/s]

Epoch 16/60 | Base: 0.026086 Lap: 0.039766 Edge: 0.022213 | SpecLow: 0.174133 SpecHigh: 1.343048 | Data: 0.144950 Phys: 0.000000 Total: 0.144950 | LR=0.00091215 GradNorm=0.383 NegDet=0.000 | Val: Data=0.142289 Phys=0.000000 Total=0.142289 NegDet=0.000 | Sched(Wlow=0.149, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.94) | Time: 19.10s

100%|████████████| 60/60 [00:18<00:00, 3.22it/s]

Epoch 17/60 | Base: 0.025585 Lap: 0.039004 Edge: 0.021759 | SpecLow: 0.166488 SpecHigh: 1.295050 | Data: 0.139252 Phys: 0.000000 Total: 0.139252 | LR=0.00089611 GradNorm=0.357 NegDet=0.000 | Val: Data=0.137445 Phys=0.000000 Total=0.137445 NegDet=0.000 | Sched(Wlow=0.143, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.97) | Time: 19.21s

100%|████████████| 60/60 [00:18<00:00, 3.22it/s]

Epoch 18/60 | Base: 0.025602 Lap: 0.038521 Edge: 0.021806 | SpecLow: 0.166821 SpecHigh: 1.262157 | Data: 0.136299 Phys: 0.000000 Total: 0.136299 | LR=0.0008789 GradNorm=0.473 NegDet=0.000 | Val: Data=0.136274 Phys=0.000000 Total=0.136274 NegDet=0.000 | Sched(Wlow=0.137, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=0.99) | Time: 19.22s

100%|████████████| 60/60 [00:18<00:00, 3.18it/s]

Epoch 19/60 | Base: 0.024804 Lap: 0.038195 Edge: 0.021048 | SpecLow: 0.155272 SpecHigh: 1.235048 | Data: 0.131167 Phys: 0.000000 Total: 0.131167 | LR=0.00086059 GradNorm=0.352 NegDet=0.000 | Val: Data=0.130391 Phys=0.000000 Total=0.130391 NegDet=0.000 | Sched(Wlow=0.131, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 19.39s

100%|████████████| 60/60 [00:18<00:00, 3.20it/s]

Epoch 20/60 | Base: 0.024310 Lap: 0.037770 Edge: 0.020592 | SpecLow: 0.147395 SpecHigh: 1.206057 | Data: 0.126858 Phys: 0.000000 Total: 0.126858 | LR=0.00084124 GradNorm=0.301 NegDet=0.000 | Val: Data=0.127054 Phys=0.000000 Total=0.127054 NegDet=0.000 | Sched(Wlow=0.126, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 19.29s

100%|████████████| 60/60 [00:18<00:00, 3.21it/s]

Epoch 21/60 | Base: 0.024180 Lap: 0.037149 Edge: 0.020491 | SpecLow: 0.147662 SpecHigh: 1.179193 | Data: 0.124140 Phys: 0.000000 Total: 0.124140 | LR=0.0008209 GradNorm=0.269 NegDet=0.000 | Val: Data=0.124198 Phys=0.000000 Total=0.124198 NegDet=0.000 | Sched(Wlow=0.120, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 19.22s

100%|████████████| 60/60 [00:19<00:00, 3.13it/s]

Epoch 22/60 | Base: 0.024011 Lap: 0.036888 Edge: 0.020348 | SpecLow: 0.146954 SpecHigh: 1.161850 | Data: 0.121910 Phys: 0.000000 Total: 0.121910 | LR=0.00079964 GradNorm=0.287 NegDet=0.000 | Val: Data=0.121162 Phys=0.000000 Total=0.121162 NegDet=0.000 | Sched(Wlow=0.114, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 19.76s

100%|████████████| 60/60 [00:18<00:00, 3.23it/s]

Epoch 23/60 | Base: 0.023786 Lap: 0.036706 Edge: 0.020151 | SpecLow: 0.140382 SpecHigh: 1.145006 | Data: 0.119043 Phys: 0.000000 Total: 0.119043 | LR=0.00077754 GradNorm=0.355 NegDet=0.000 | Val: Data=0.118409 Phys=0.000000 Total=0.118409 NegDet=0.000 | Sched(Wlow=0.108, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 19.18s

100%|████████████| 60/60 [00:18<00:00, 3.25it/s]

Epoch 24/60 | Base: 0.023270 Lap: 0.036373 Edge: 0.019667 | SpecLow: 0.131934 SpecHigh: 1.125070 | Data: 0.115507 Phys: 0.000000 Total: 0.115507 | LR=0.00075467 GradNorm=0.264 NegDet=0.000 | Val: Data=0.115774 Phys=0.000000 Total=0.115774 NegDet=0.000 | Sched(Wlow=0.102, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 19.07s

100%|████████████| 60/60 [00:18<00:00, 3.22it/s]

Epoch 25/60 | Base: 0.023223 Lap: 0.036173 Edge: 0.019642 | SpecLow: 0.131491 SpecHigh: 1.110091 | Data: 0.113746 Phys: 0.000000 Total: 0.113746 | LR=0.00073109 GradNorm=0.325 NegDet=0.000 | Val: Data=0.113462 Phys=0.000000 Total=0.113462 NegDet=0.000 | Sched(Wlow=0.097, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10, Wphys=1.00) | Time: 19.18s

100%|████████████| 60/60 [00:18<00:00, 3.16it/s]

Epoch 26/60 | Base: 0.022908 Lap: 0.035959 Edge: 0.019352 | SpecLow: 0.130766 SpecHigh: 1.095736 | Data: 0.111697 Phys: 0.000000 Total: 0.111697 | LR=0.00070689 GradNorm=0.227

NegDet=0.000 | Val: Data=0.112191 Phys=0.000000 Total=0.112191 NegDet=0.000 |
Sched(Wlow=0.092, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.10,
Wphys=1.00) | Time: 19.55s

100%|████████████| 60/60 [00:18<00:00, 3.24it/s]

Epoch 27/60 | Base: 0.022657 Lap: 0.035771 Edge: 0.019127 | SpecLow: 0.124611 SpecHigh:
1.081922 | Data: 0.109331 Phys: 0.000000 Total: 0.109331 | LR=0.00068215 GradNorm=0.261
NegDet=0.000 | Val: Data=0.108993 Phys=0.000000 Total=0.108993 NegDet=0.000 |
Sched(Wlow=0.086, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.11,
Wphys=1.00) | Time: 19.09s

100%|████████████| 60/60 [00:18<00:00, 3.20it/s]

Epoch 28/60 | Base: 0.022159 Lap: 0.035599 Edge: 0.018657 | SpecLow: 0.116534 SpecHigh:
1.066597 | Data: 0.106514 Phys: 0.000000 Total: 0.106514 | LR=0.00065694 GradNorm=0.159
NegDet=0.000 | Val: Data=0.107061 Phys=0.000000 Total=0.107061 NegDet=0.000 |
Sched(Wlow=0.082, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.11,
Wphys=1.00) | Time: 19.36s

100%|████████████| 60/60 [00:18<00:00, 3.21it/s]

Epoch 29/60 | Base: 0.022068 Lap: 0.035422 Edge: 0.018585 | SpecLow: 0.114748 SpecHigh:
1.055675 | Data: 0.105040 Phys: 0.000000 Total: 0.105040 | LR=0.00063135 GradNorm=0.223
NegDet=0.000 | Val: Data=0.105268 Phys=0.000000 Total=0.105268 NegDet=0.000 |
Sched(Wlow=0.077, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.12,
Wphys=1.00) | Time: 19.25s

100%|████████████| 60/60 [00:18<00:00, 3.20it/s]

Epoch 30/60 | Base: 0.021858 Lap: 0.035296 Edge: 0.018397 | SpecLow: 0.111782 SpecHigh:
1.044207 | Data: 0.103365 Phys: 0.000000 Total: 0.103365 | LR=0.00060546 GradNorm=0.221
NegDet=0.000 | Val: Data=0.103723 Phys=0.000000 Total=0.103723 NegDet=0.000 |
Sched(Wlow=0.073, Whigh=0.060, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.13,
Wphys=1.00) | Time: 19.30s
Checkpoint saved at epoch 30 (50% complete)

100%|████████████| 60/60 [00:18<00:00, 3.24it/s]

Epoch 31/60 | Base: 0.021630 Lap: 0.035180 Edge: 0.018185 | SpecLow: 0.107101 SpecHigh:
1.035856 | Data: 0.102914 Phys: 0.000000 Total: 0.102914 | LR=0.00057936 GradNorm=0.233
NegDet=0.000 | Val: Data=0.103161 Phys=0.000000 Total=0.103161 NegDet=0.000 |
Sched(Wlow=0.069, Whigh=0.061, pH=1.20, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.14,
Wphys=1.00) | Time: 19.10s

100%|████████████| 60/60 [00:18<00:00, 3.19it/s]

Epoch 32/60 | Base: 0.021357 Lap: 0.035020 Edge: 0.017924 | SpecLow: 0.105819 SpecHigh:
1.027494 | Data: 0.104871 Phys: 0.000000 Total: 0.104871 | LR=0.00055314 GradNorm=0.180
NegDet=0.000 | Val: Data=0.105263 Phys=0.000000 Total=0.105263 NegDet=0.000 |
Sched(Wlow=0.065, Whigh=0.064, pH=1.22, Wg=0.60, Wlap=0.20, Wedge=0.20, ROI=0.15,
Wphys=1.00) | Time: 19.37s

100%|████████████| 60/60 [00:18<00:00, 3.20it/s]

Epoch 33/60 | Base: 0.021357 Lap: 0.034828 Edge: 0.017921 | SpecLow: 0.108171 SpecHigh: 1.022686 | Data: 0.109757 Phys: 0.000000 Total: 0.109757 | LR=0.00052686 GradNorm=0.214 NegDet=0.000 | Val: Data=0.110337 Phys=0.000000 Total=0.110337 NegDet=0.000 | Sched(Wlow=0.062, Whigh=0.070, pH=1.24, Wg=0.61, Wlap=0.20, Wedge=0.20, ROI=0.17, Wphys=1.00) | Time: 19.32s

100%|████████████| 60/60 [00:18<00:00, 3.22it/s]

Epoch 34/60 | Base: 0.021350 Lap: 0.034662 Edge: 0.017902 | SpecLow: 0.110503 SpecHigh: 1.022904 | Data: 0.117082 Phys: 0.000000 Total: 0.117082 | LR=0.00050064 GradNorm=0.235 NegDet=0.000 | Val: Data=0.117448 Phys=0.000000 Total=0.117448 NegDet=0.000 | Sched(Wlow=0.059, Whigh=0.077, pH=1.28, Wg=0.61, Wlap=0.20, Wedge=0.20, ROI=0.18, Wphys=1.00) | Time: 19.20s

100%|████████████| 60/60 [00:18<00:00, 3.23it/s]

Epoch 35/60 | Base: 0.021334 Lap: 0.034475 Edge: 0.017869 | SpecLow: 0.113667 SpecHigh: 1.020914 | Data: 0.126292 Phys: 0.000000 Total: 0.126292 | LR=0.00047454 GradNorm=0.251 NegDet=0.000 | Val: Data=0.126537 Phys=0.000000 Total=0.126537 NegDet=0.000 | Sched(Wlow=0.056, Whigh=0.086, pH=1.32, Wg=0.62, Wlap=0.21, Wedge=0.20, ROI=0.20, Wphys=1.00) | Time: 19.10s

100%|████████████| 60/60 [00:18<00:00, 3.22it/s]

Epoch 36/60 | Base: 0.021454 Lap: 0.034258 Edge: 0.017959 | SpecLow: 0.120343 SpecHigh: 1.023121 | Data: 0.138149 Phys: 0.000000 Total: 0.138149 | LR=0.00044865 GradNorm=0.258 NegDet=0.000 | Val: Data=0.138086 Phys=0.000000 Total=0.138086 NegDet=0.000 | Sched(Wlow=0.054, Whigh=0.097, pH=1.37, Wg=0.62, Wlap=0.21, Wedge=0.20, ROI=0.21, Wphys=1.00) | Time: 19.22s
Early stopping at epoch 36