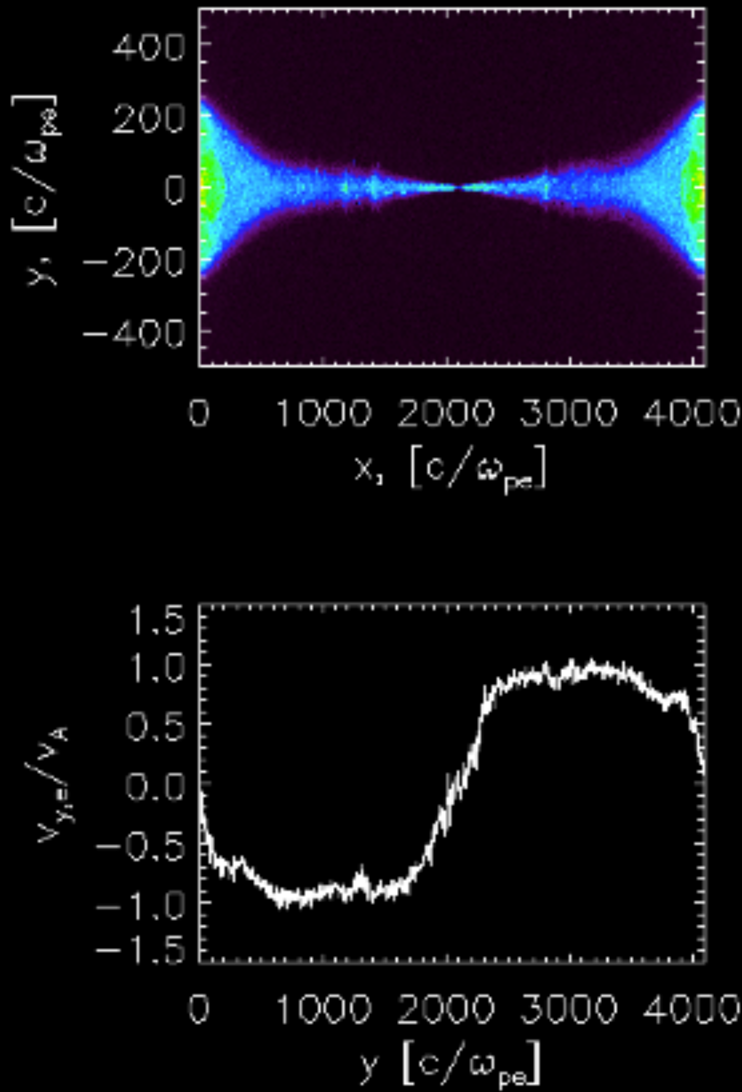
Boundary conditions

Adaptive

Outflow

Periodic



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x, [c/ωpe]
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0.5
0.0
−0.5
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−1.5
vy,e/vA
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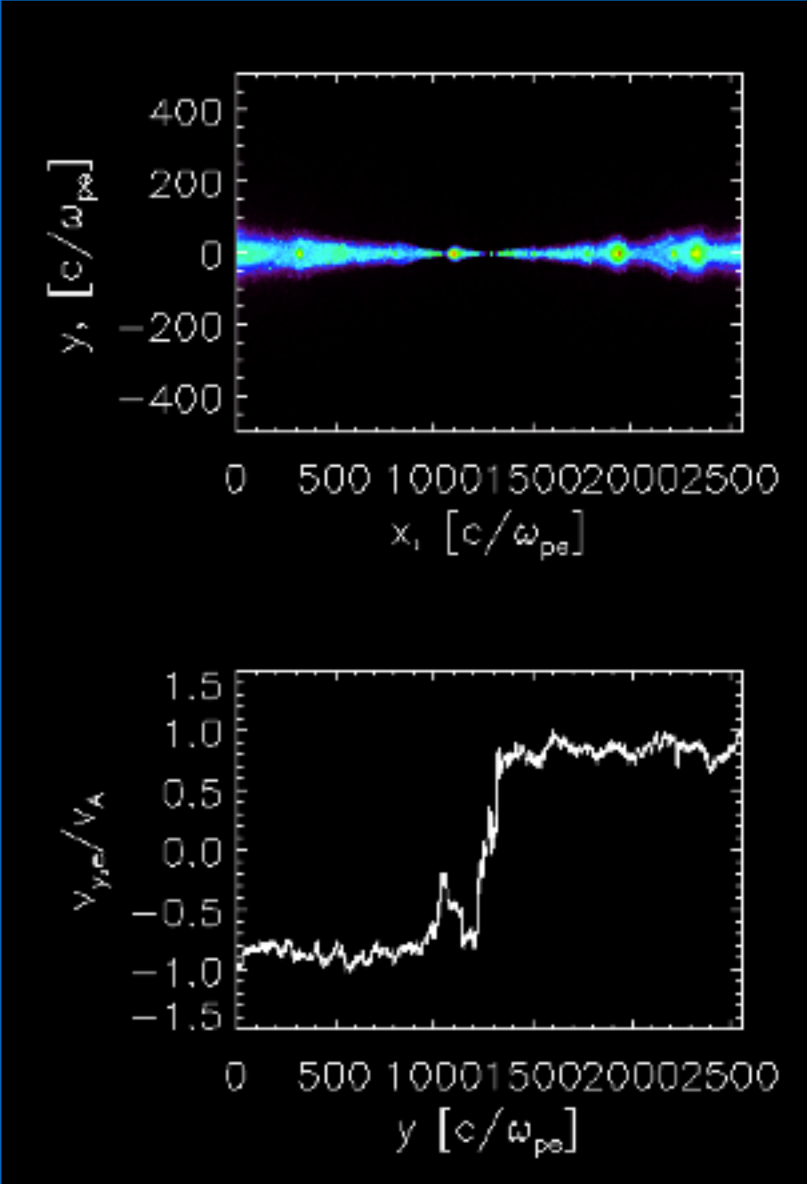
2000
3000
4000
y [c/ωpe]

[redacted]

[redacted]

[redacted]



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x, [c/ωpe]
vy,e/vA
1.5
1.0
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0.0
−0.5
−1.0
−1.5
y [c/ωpe]

[redacted]

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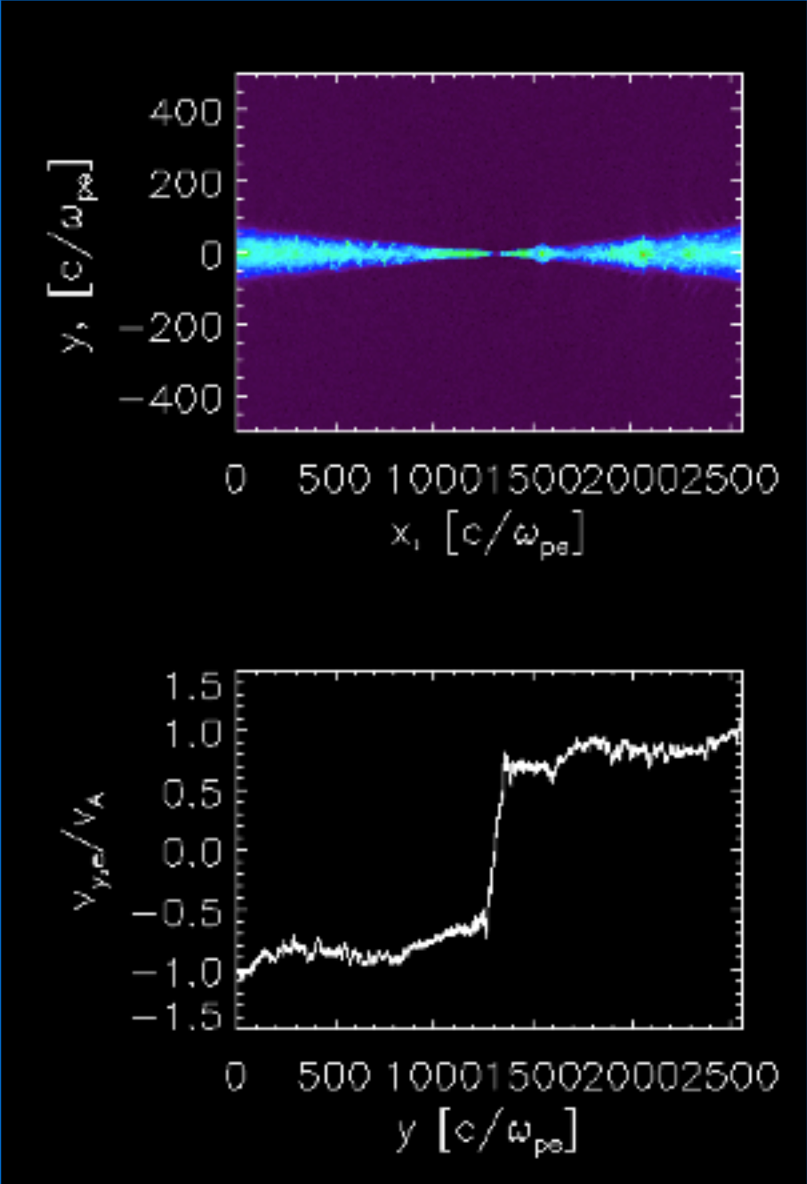
[redacted]



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y [c/ωpe]

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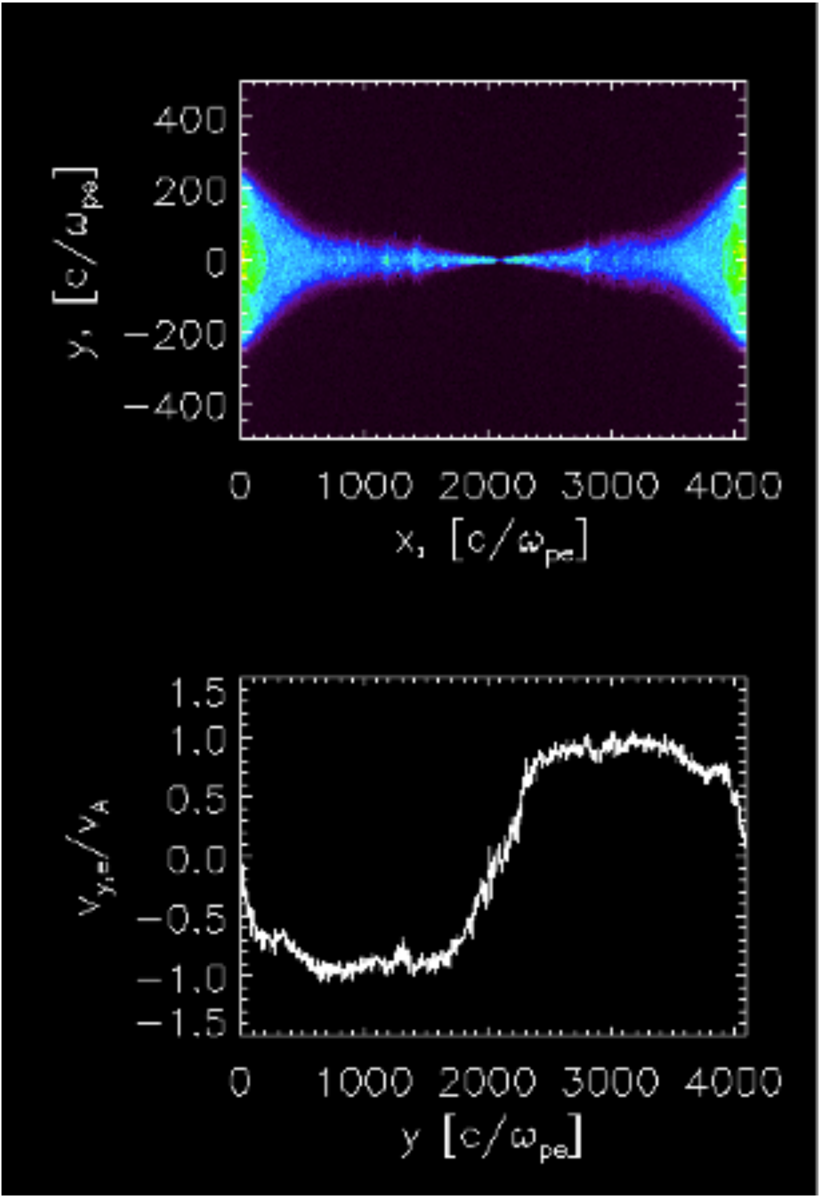
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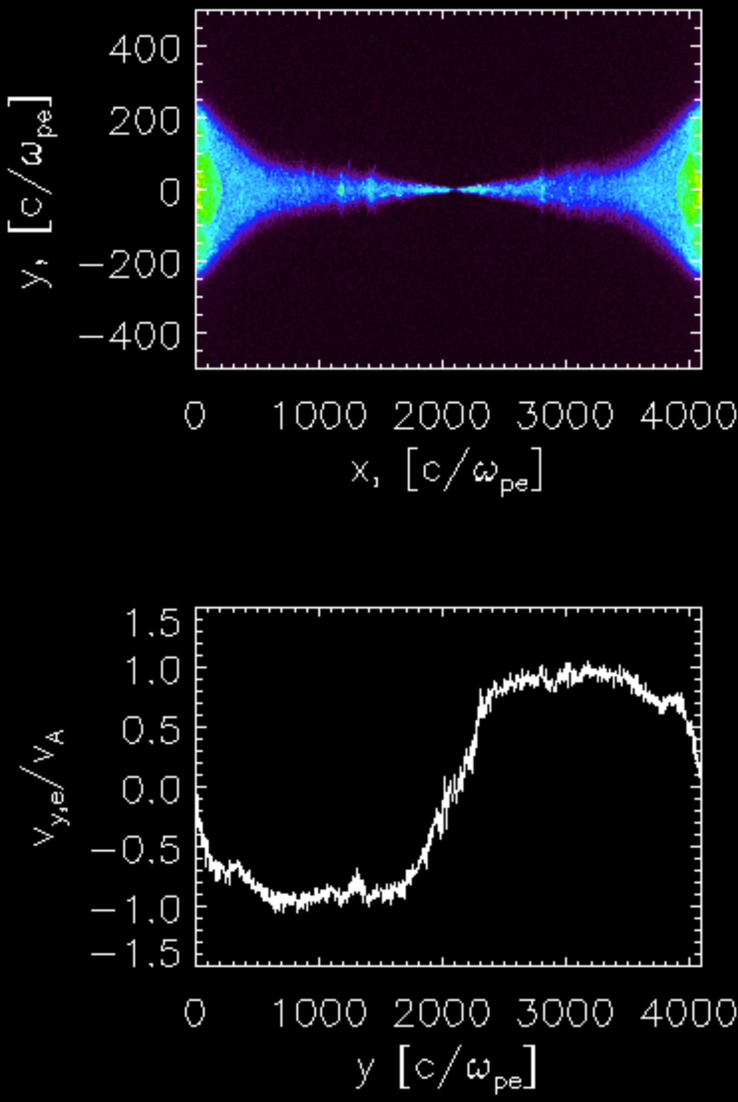
y [c/ωpe]



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x, [c/ωpe]
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vy,e/vA
0
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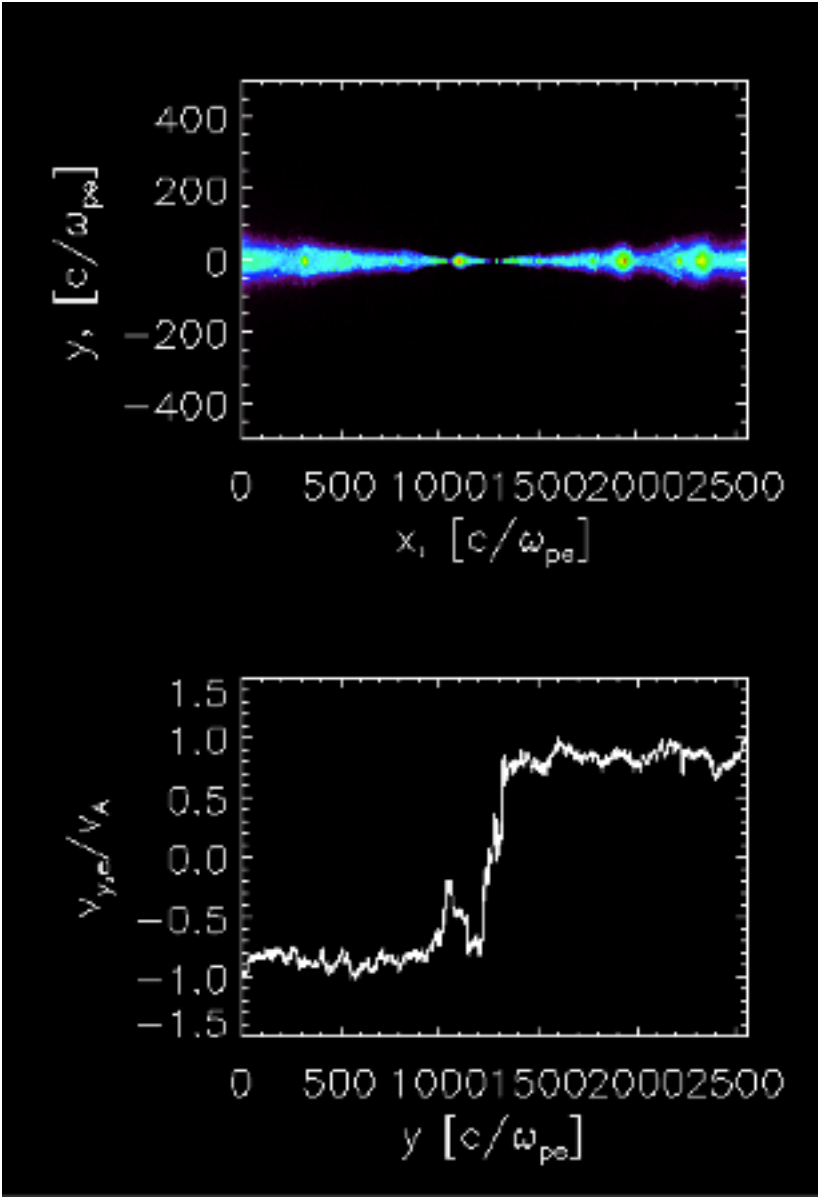
y [c/ωpe]



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x, [c/ω_pe]
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0.5
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−1.5
v_y,e/v_A
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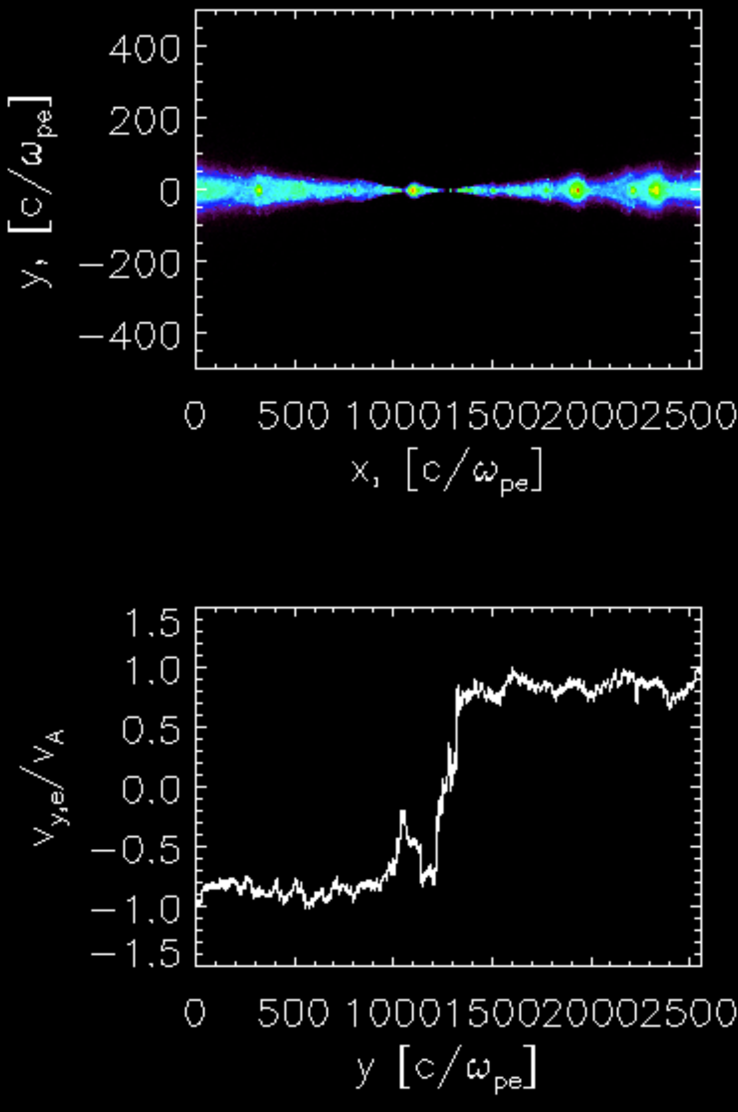
y [c/ω_pe]



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y, [c/ω_pe]
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x, [c/ω_pe]
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1.0
0.5
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−0.5
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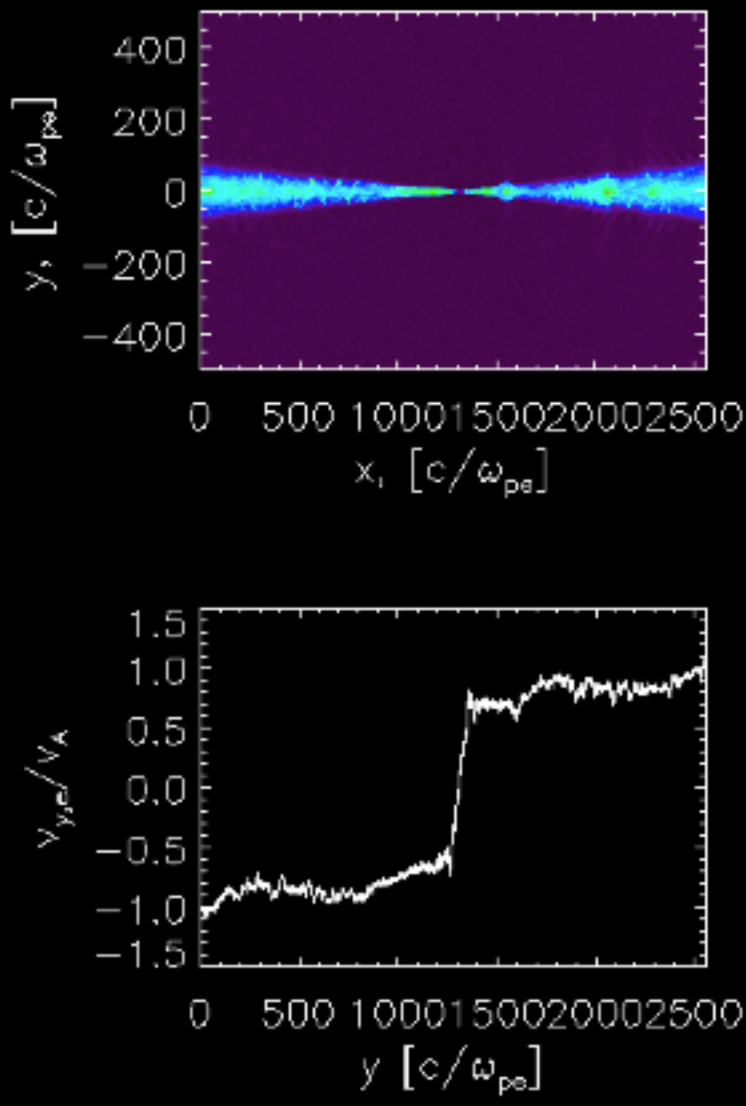
−1.5
V_y,e/V_A
0
500
1000
1500
2000
2500
y [c/ω_pe]



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x, [c/ωpe]
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1.0
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0.0
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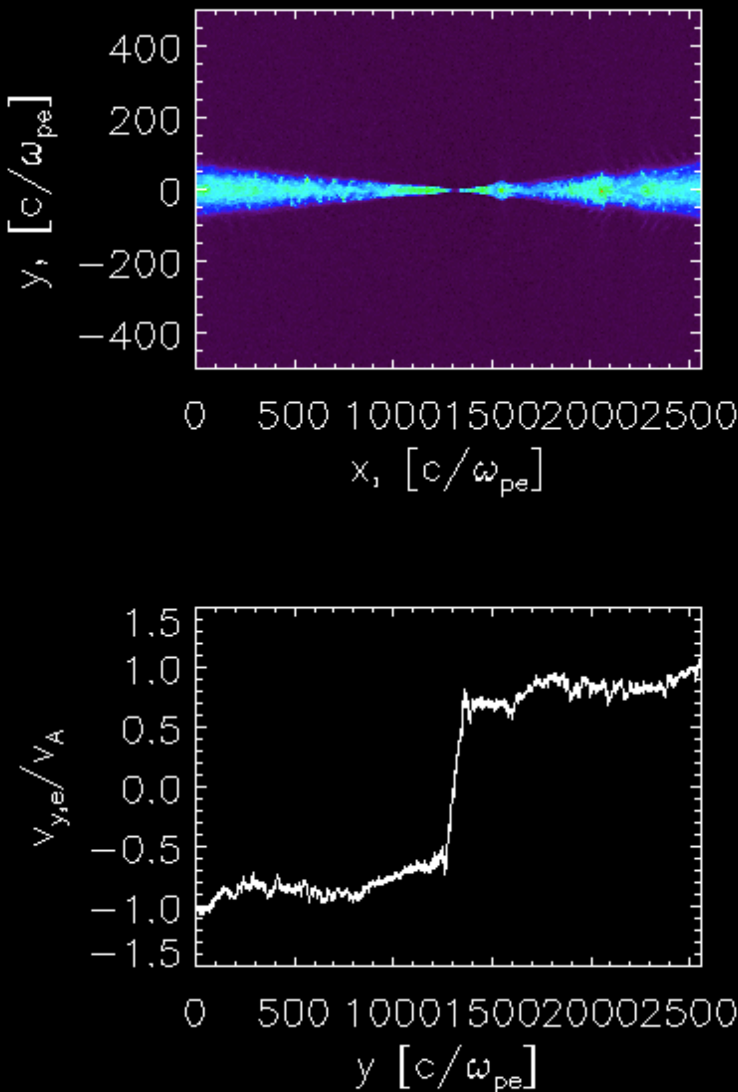
−1.0
−1.5
vy,e/vA
0
500
1000
1500
2000
2500
y [c/ωpe]



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y, [c/ωpe]
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500
1000
1500
2000
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x, [c/ωpe]
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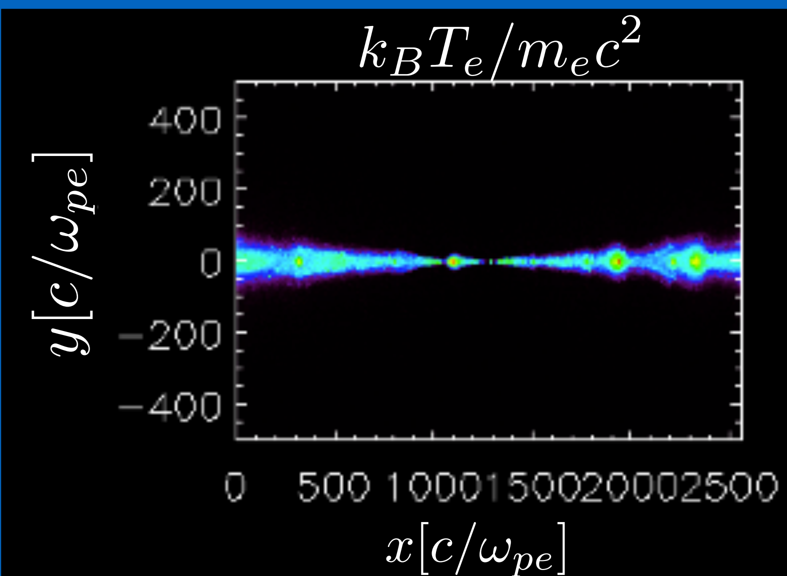
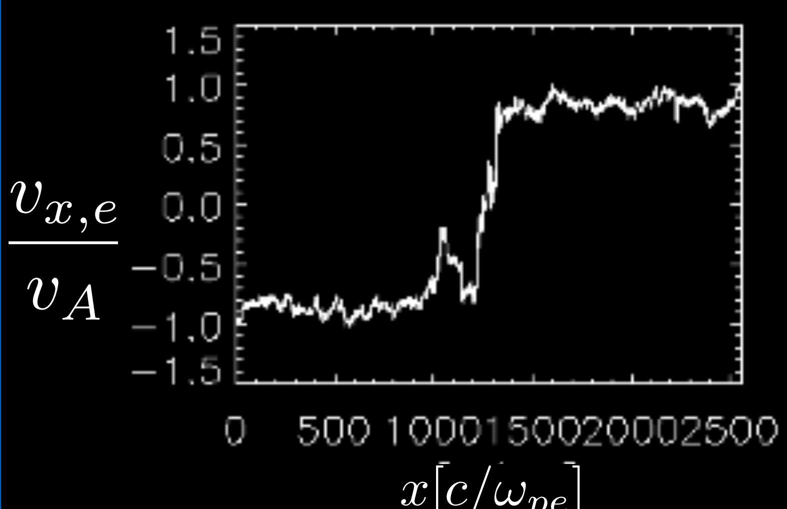
1.0
0.5
0.0
−0.5
−1.0
−1.5
Vy,e/VA
0
500
1000
1500
2000
2500
y [c/ωpe]

Boundary conditions

Outflow

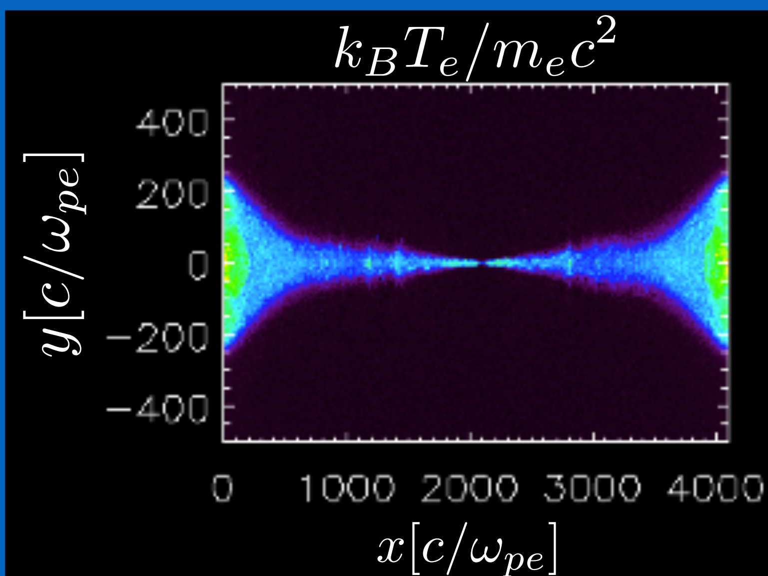
- Particles escape along x-dir.
- Allows for study of long-term evolution of system

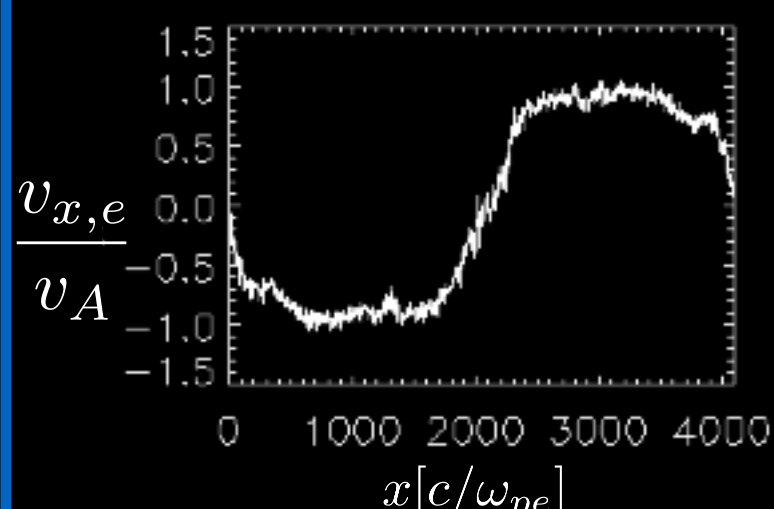




Periodic

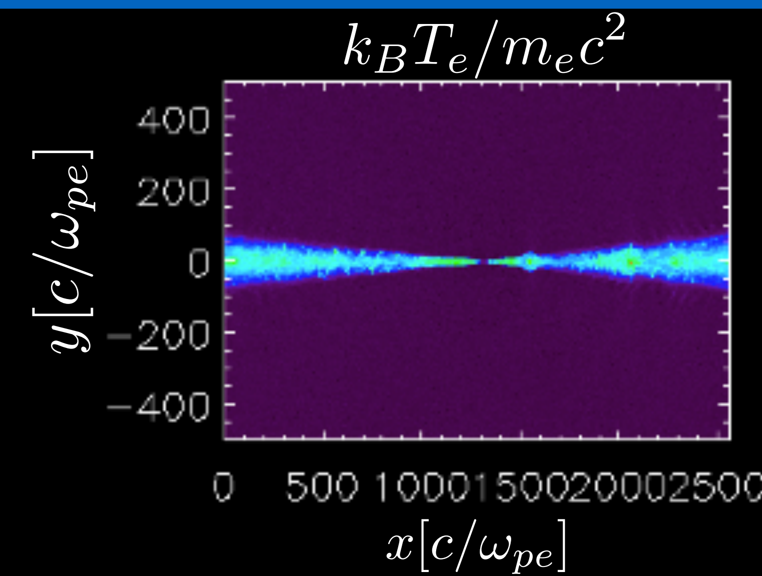
- No particles are lost
- However, sensitive to boundaries after 1/2 Alfvén crossing-time

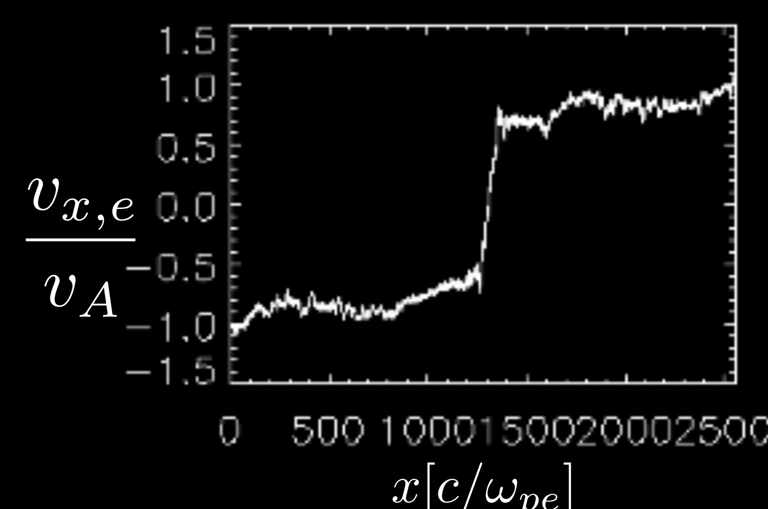




Adaptive

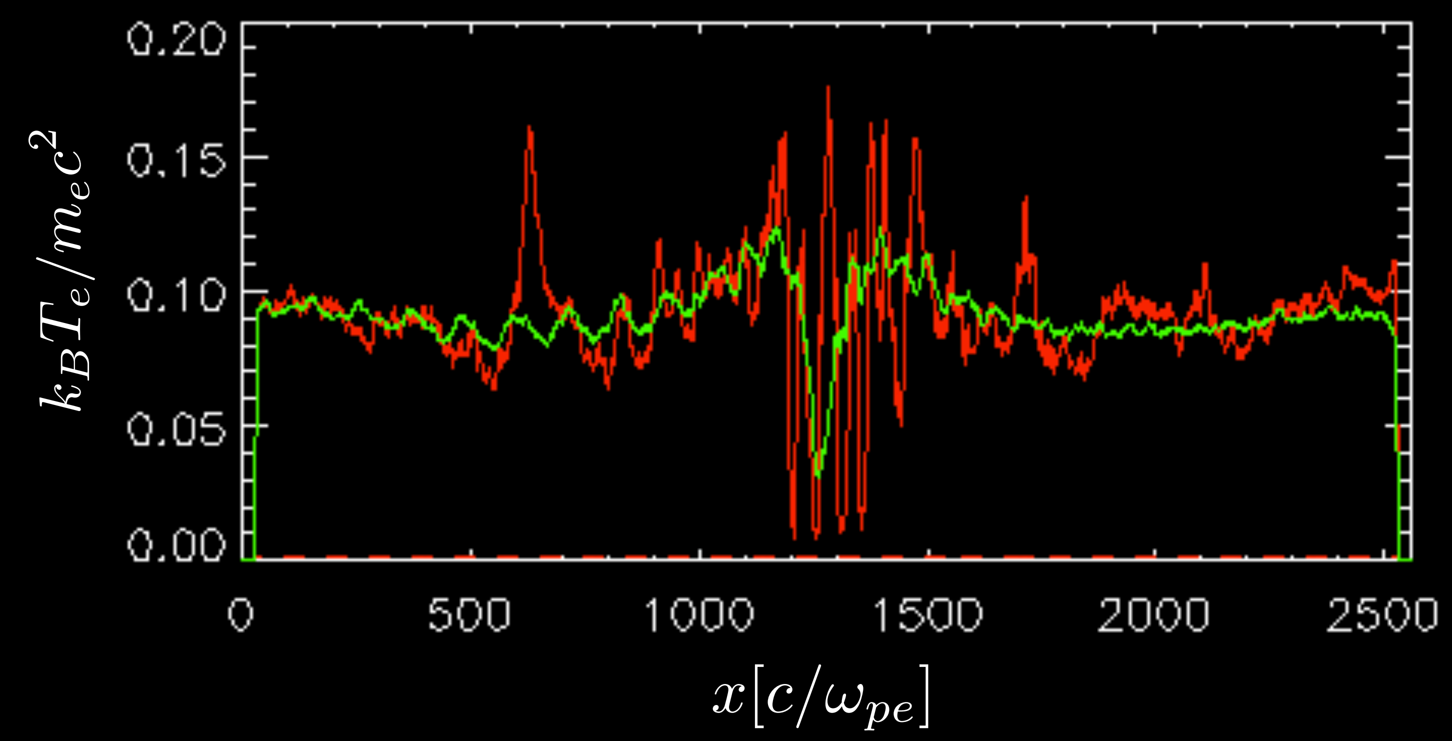
- Modified version of outflow boundary condition
- Includes additional controls necessary for high-beta case





The plasma reaches a quasi-steady state

- To extract a meaningful outflow temperature, temperature profile should be flat
- Alfvén velocity should be saturated in current sheet



Alfvén velocity

$$\frac{v_A}{c} = \sqrt{\frac{\sigma_w}{1+\sigma_w}}$$