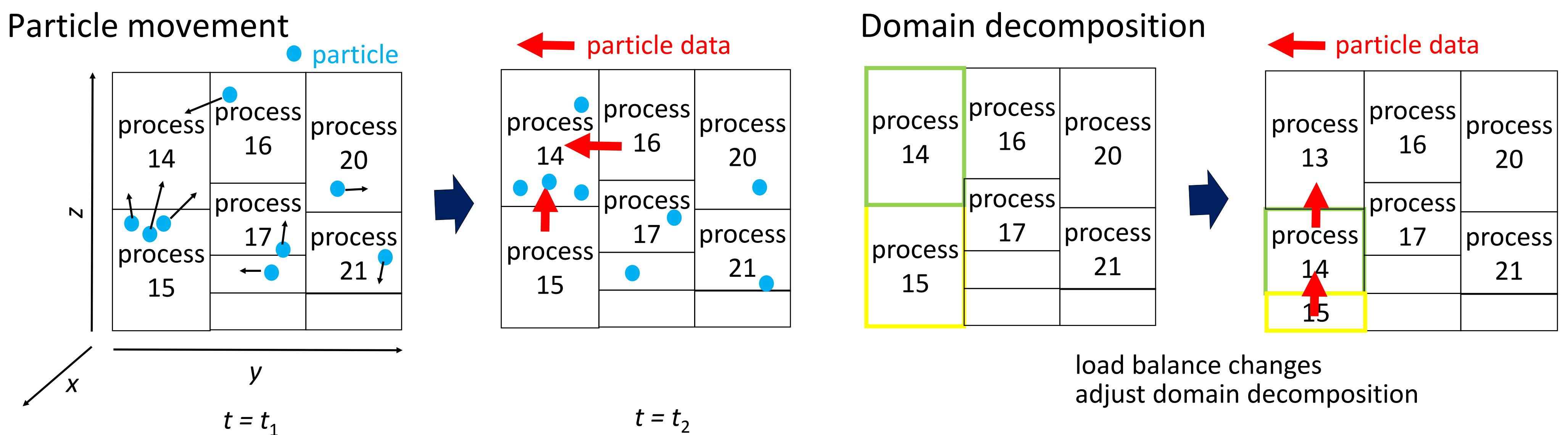


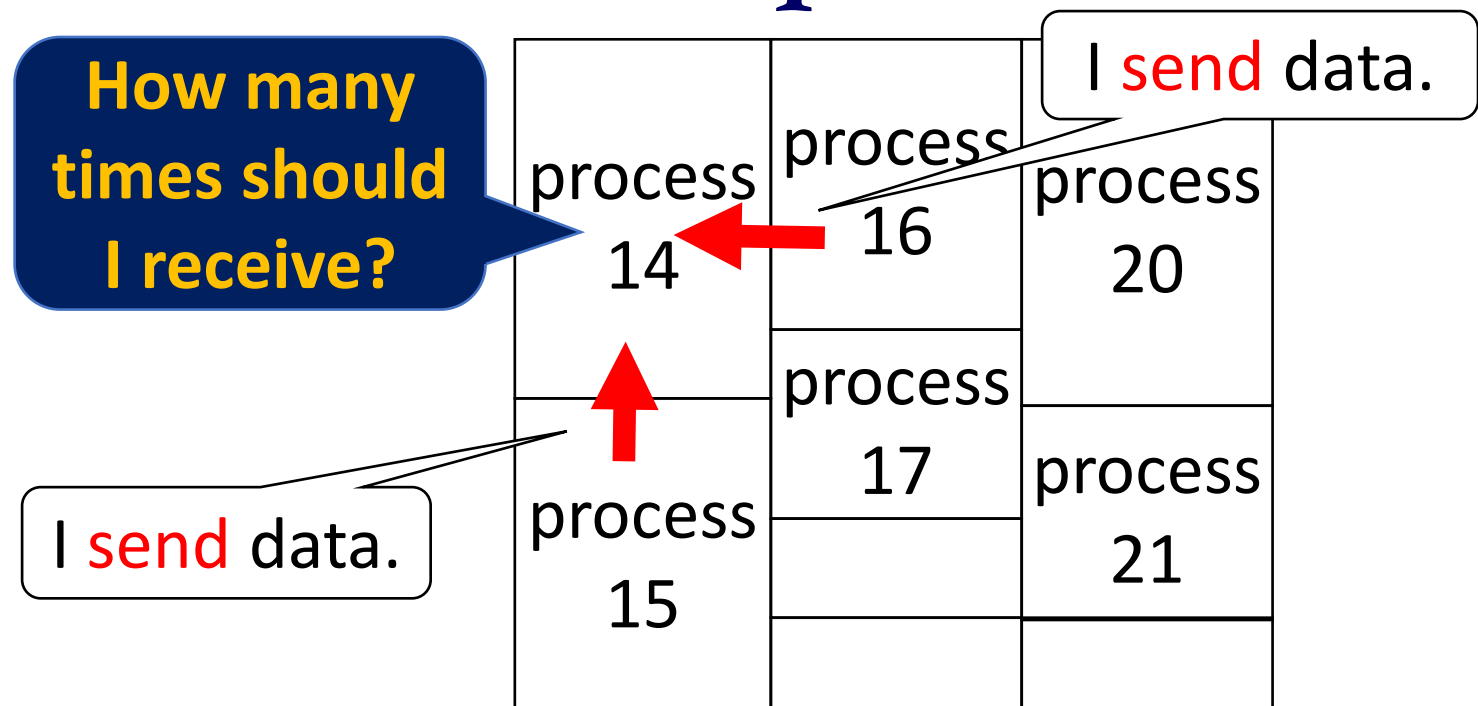
Efficient Particle Data Communication in Particle-based Simulations

Ryutaro Susukita

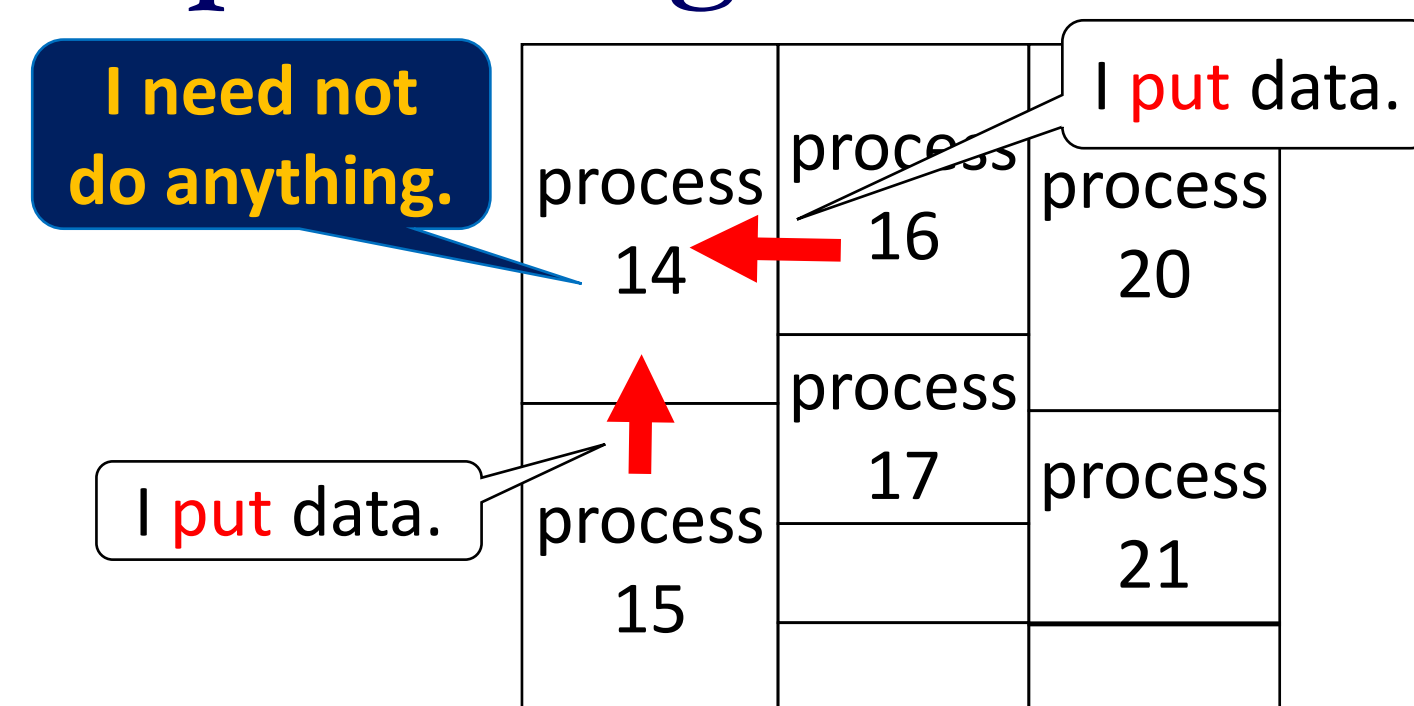
Particle Data Communication in Particle-based Simulations



Send-recv Implementation

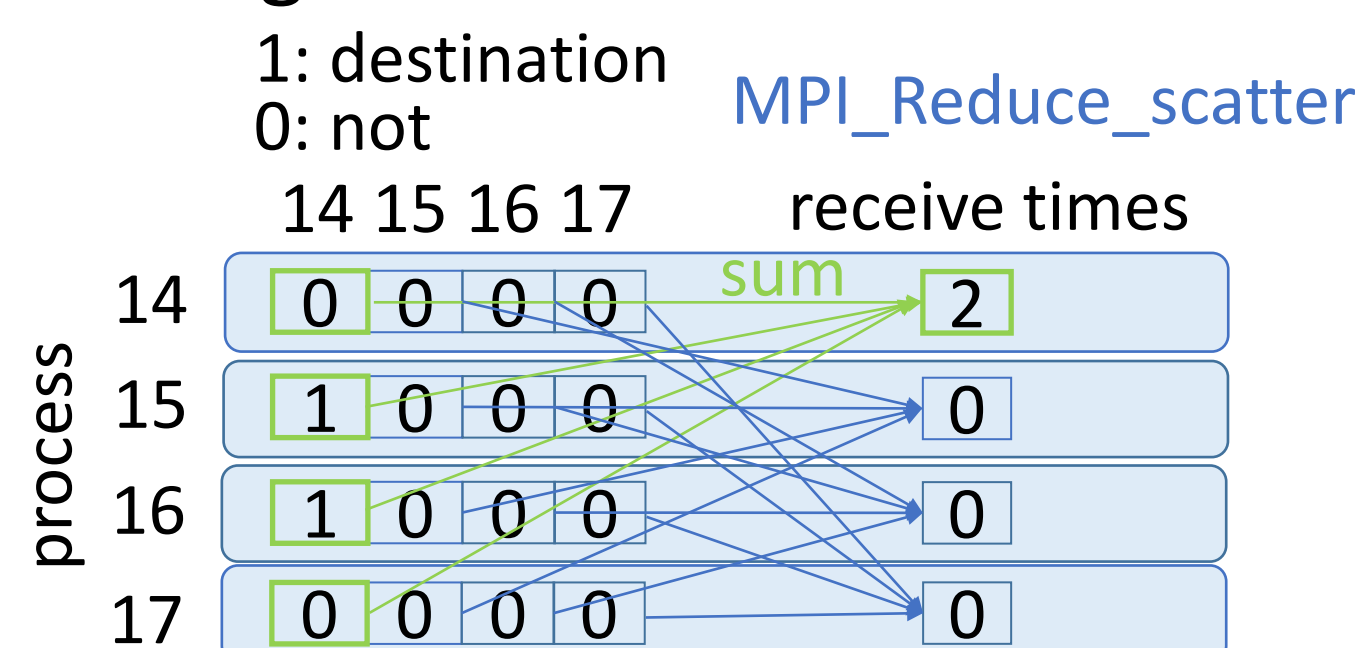


Imple. using One-sided Communication



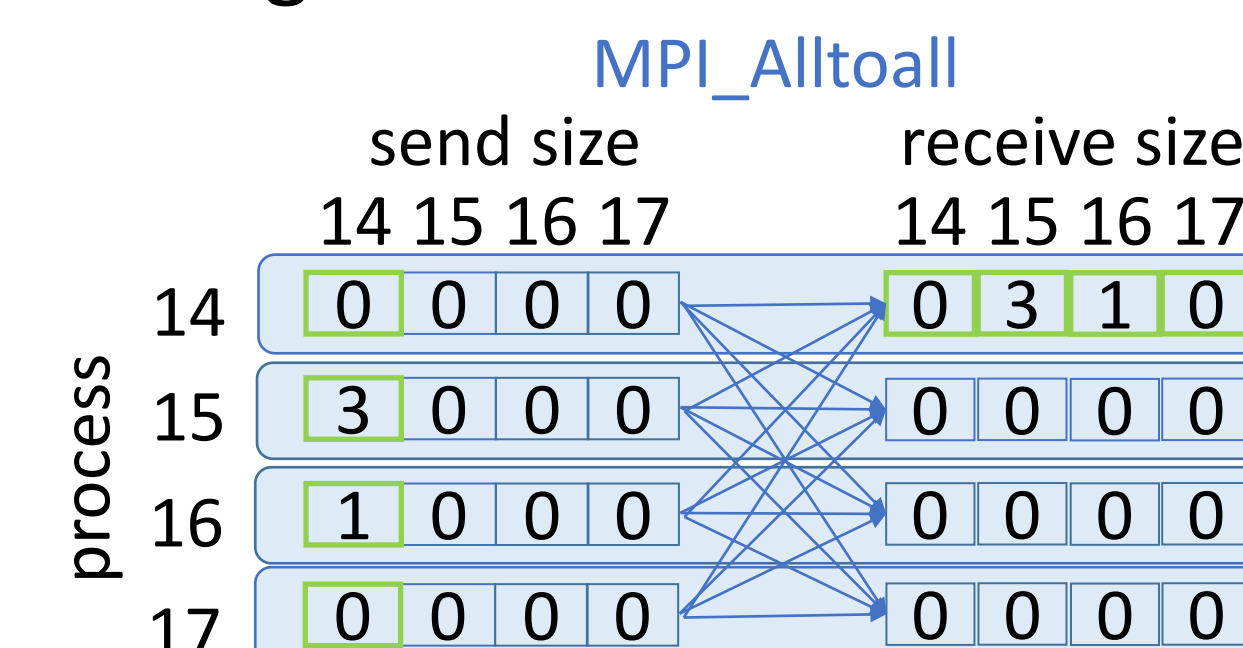
Reduce-scatter

Finding out receive times

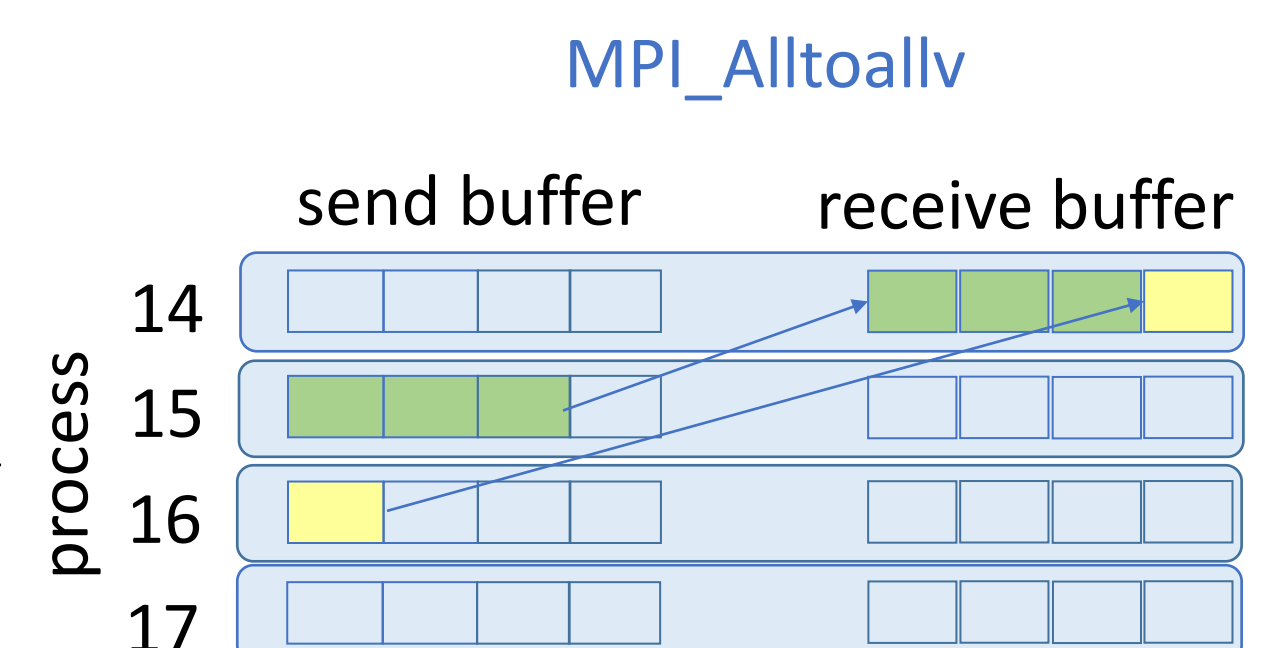


Implementation using Two All-to-all's

Finding out receive sizes



Particle data



Implementation on ACP Communication Library

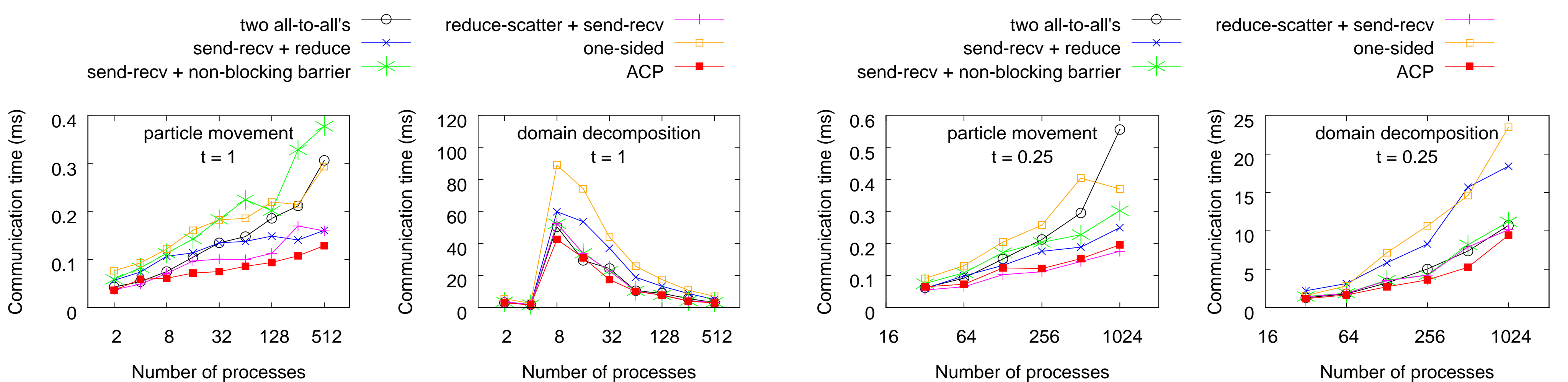
➤ One-sided communication

➤ Direct control of communication timing

Performance Comparison in Simulation

270³ particles

100³ particles at 32 processes - 682³ particles at 1024 processes



ACP or reduce-scatter + send-recv is fastest

Communications in gravitational N -body simulations
Intel MPI 5.1.3 and ACP on Fujitsu PRIMERGY CX400