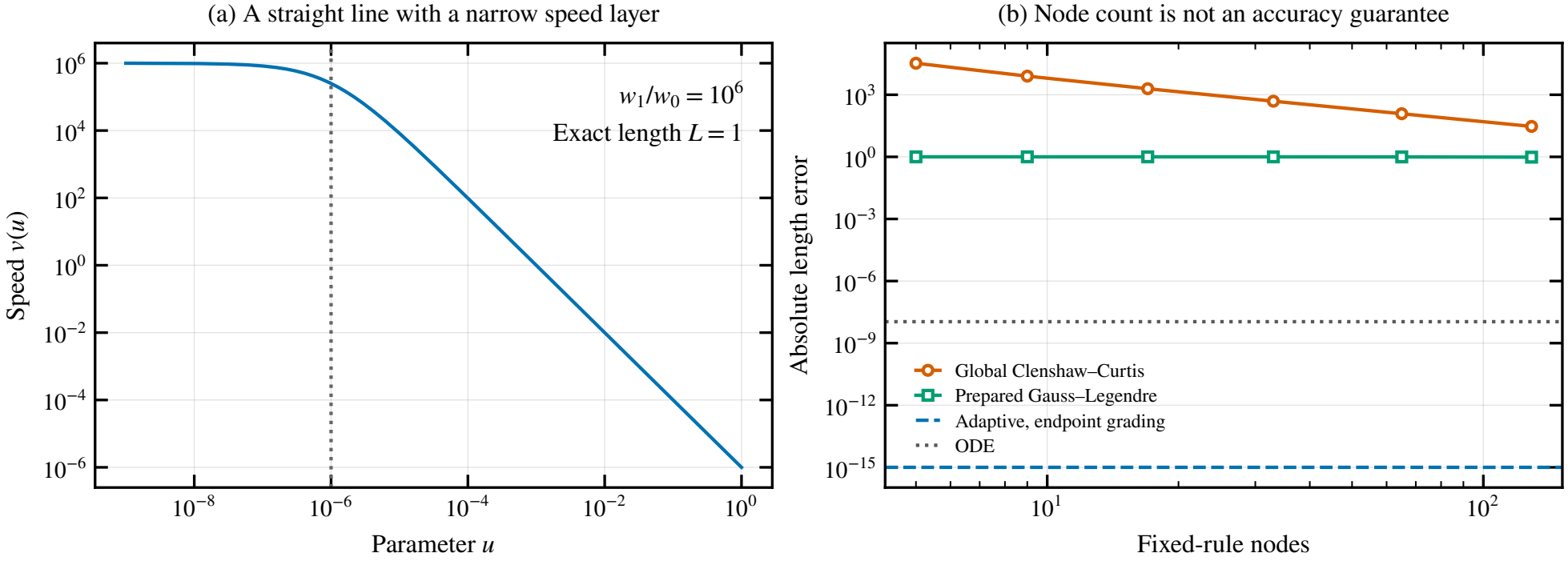

(a) A straight line with a narrow speed layer
$w_1/w_0 = 10^6$
Exact length $L = 1$
Speed $v(u)$
Parameter u
10^{6}
10^{4}
10^{2}
10^{0}
10^{-2}
10^{-4}
10^{-6}
10^{-8}
(b) Node count is not an accuracy guarantee
Absolute length error
Fixed-rule nodes
Global Clenshaw–Curtis
Prepared Gauss–Legendre
Adaptive, endpoint grading
ODE
10^{3}
10^{0}
10^{-3}
10^{-6}
10^{-9}
10^{-12}
10^{-15}
10^{1}
10^{2}