List of symbols

AR_{elp}	Armouring ratio at end of last pulse
AR_{const}	Armouring ratio at end of constant feed run
D_{sg}	Surface geometric mean grain size $[m]$
D_{subg}	Subsurface geometric mean grain size $[m]$
D_{s50}	Surface 50th percentile grain size $[m]$
D_{s84}	Surface 84th percentile grain size $[m]$
D_{s90}	Surface 90th percentile grain size $[m]$
D_{fg}	Feed geometric mean grain size $[m]$
D_{f90}	Feed 90th percentile grain size $[m]$
D_{ag}	Armoured geometric mean grain size $[m]$
D_{a90}	Armoured 90th percentile grain size $[m]$
f_{Ii}	Proportion of ith grain size class exchanged between the surface and the subsurface
F_i	Surface frequency of ith grain size class
Fr	Froude number
F_{pulse}	Pulse frequency $[1/s]$
g	Gravity $[m/s^2]$
GSD_{fluv}	Channel surface grain size distribution
GSD_{pulse}	Pulsed sediment feed grain size distribution
h	Water depth $[m]$
k_s	Roughness height $[m]$
l_r	Channel length $[m]$
L_a	Active layer thickness $[m]$
M_{pulse}	Pulse magnitude $[m^3]$
n_k	Roughness height coefficient
n_a	Scale of bed height fluctuation
p_{bi}	Bedload transport rate fraction of ith grain size class
q_b	Bedload transport rate $[m^2/s]$
q_{bi}	Fractional bedload transport rate $[m^2/s]$
Q_w	Water discharge $[m^3/s]$
S_f	Friction slope $[m/m]$
S_0	Bed slope $[m/m]$
S_{mlp}	Mean channel slope at end of last pulse [m/m]
S_{const}	Slope at the end of constant feed run [m/m
t	Time $[s]$
T_{pp}	Pulse period $[s]$
T_{fe}	Fluvial evacuation time $[s]$
T_{ar}	Fluvial armouring time $[s]$
T_{sim}	Duration of simulation $[s]$
u^*	Dimensionless shear velocity
U_{fluv}	Fluvial export velocity $[m/s]$
U_{pulse}	Virtual pulse velocity $[m/s]$
w_r	Channel width $[m]$
x	Downstream distance $[m]$
α_r	Manning-Strickler coefficient
α	Active layer exchange ratio
η_b	Bed surface elevation $[m]$
λ	Bed porosity
ρ	Water density $[kg/m^3]$
σ	Wideness of generated grain size distribution
τ_b	Boundary shear stress $[Pa]$
τ_{rm}	Reference shear stress $[Pa]$

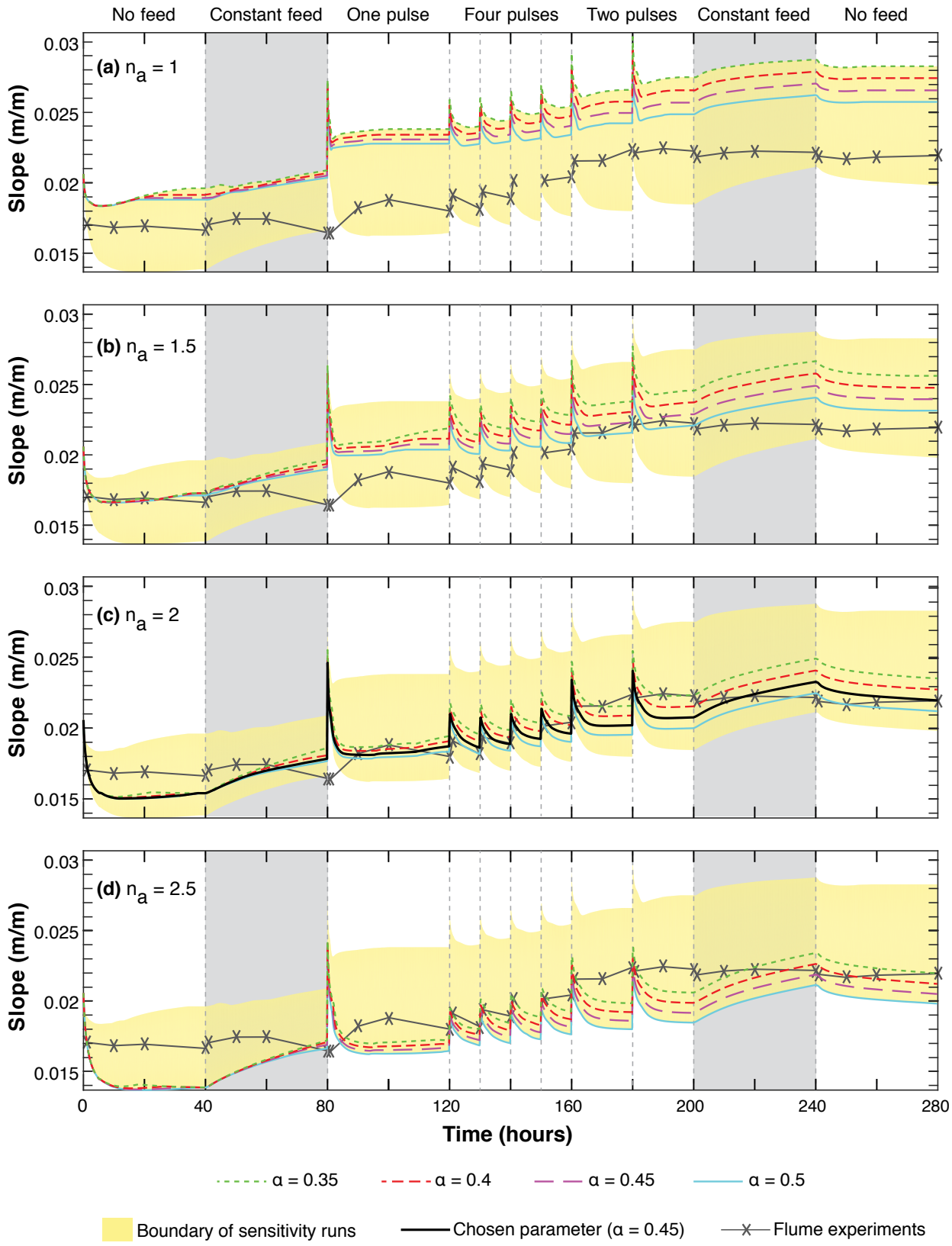

Figure S1: Sensitivity of modelled slope to active layer thickness factor n_a and active layer exchange ratio α in the 'Original flume' (OF) event sequence.

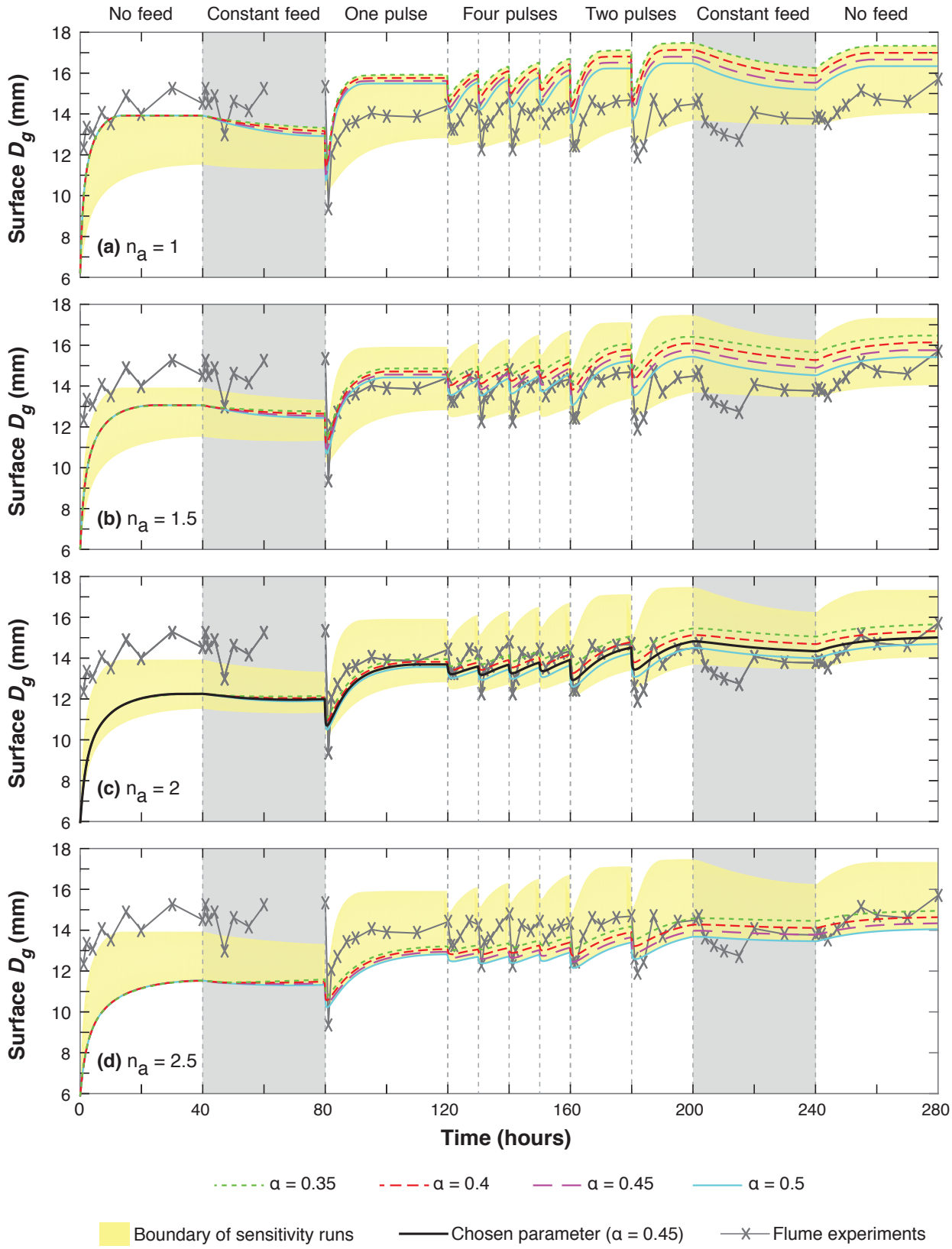

Figure S2: Sensitivity of modelled Surface D_g to active layer thickness factor n_a and active layer exchange ratio α in the 'Original flume' (OF) event sequence.

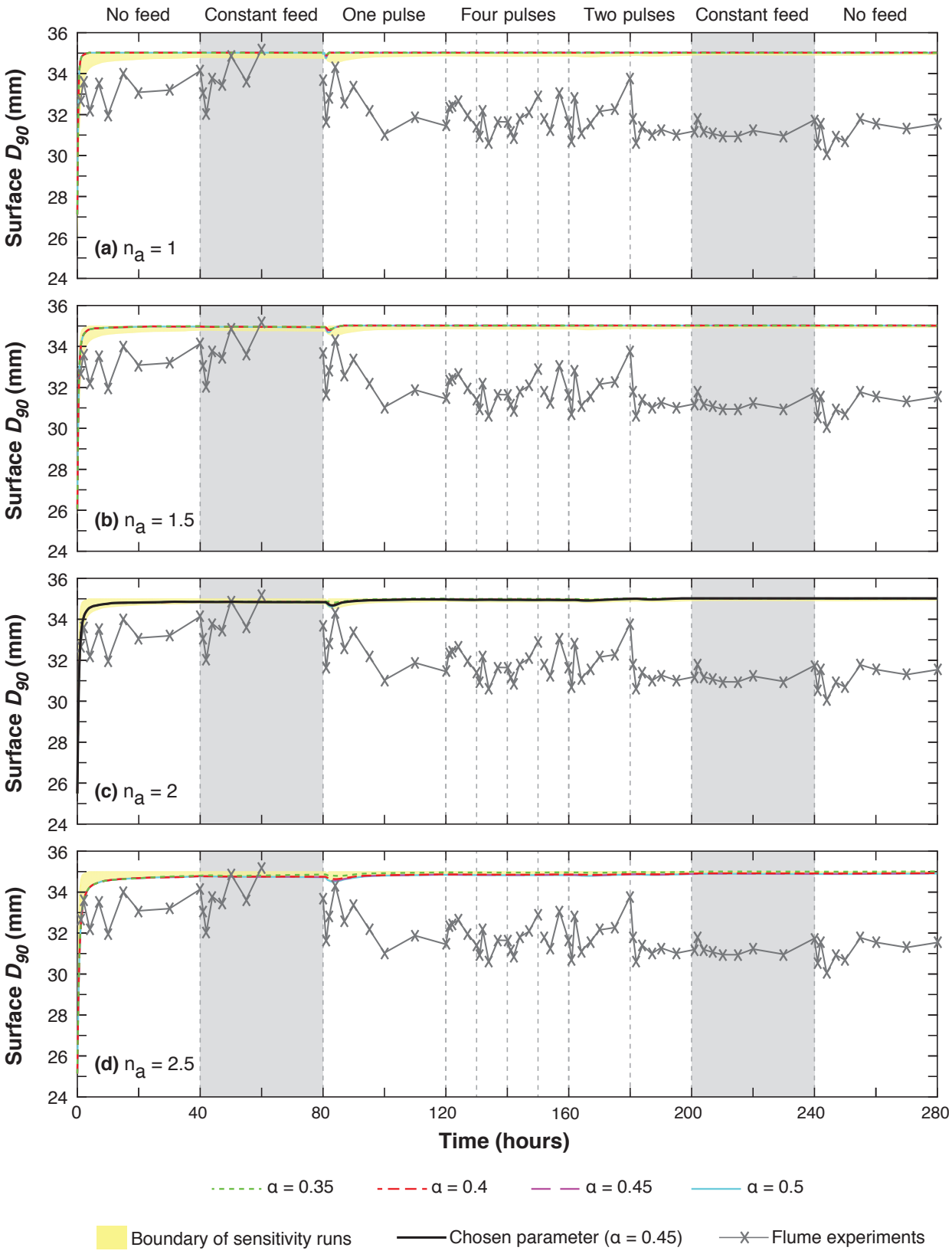

Figure S3: Sensitivity of modelled Surface D_{90} to active layer thickness factor n_a and active layer exchange ratio α in the 'Original flume' (OF) event sequence.

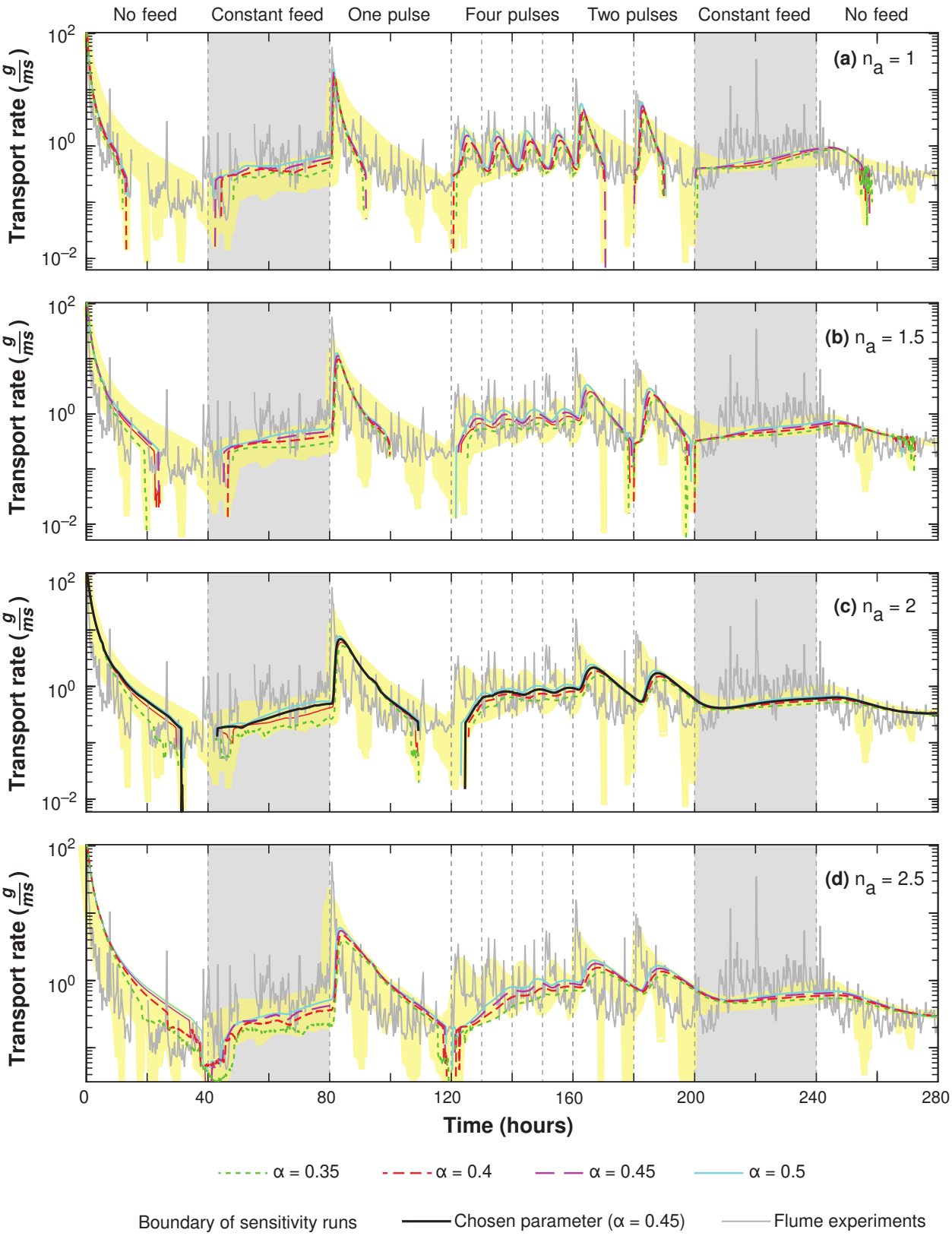

Figure S4: Sensitivity of modelled transport rate to active layer thickness factor n_a and active layer exchange ratio α in the 'Original flume' (OF) event sequence.

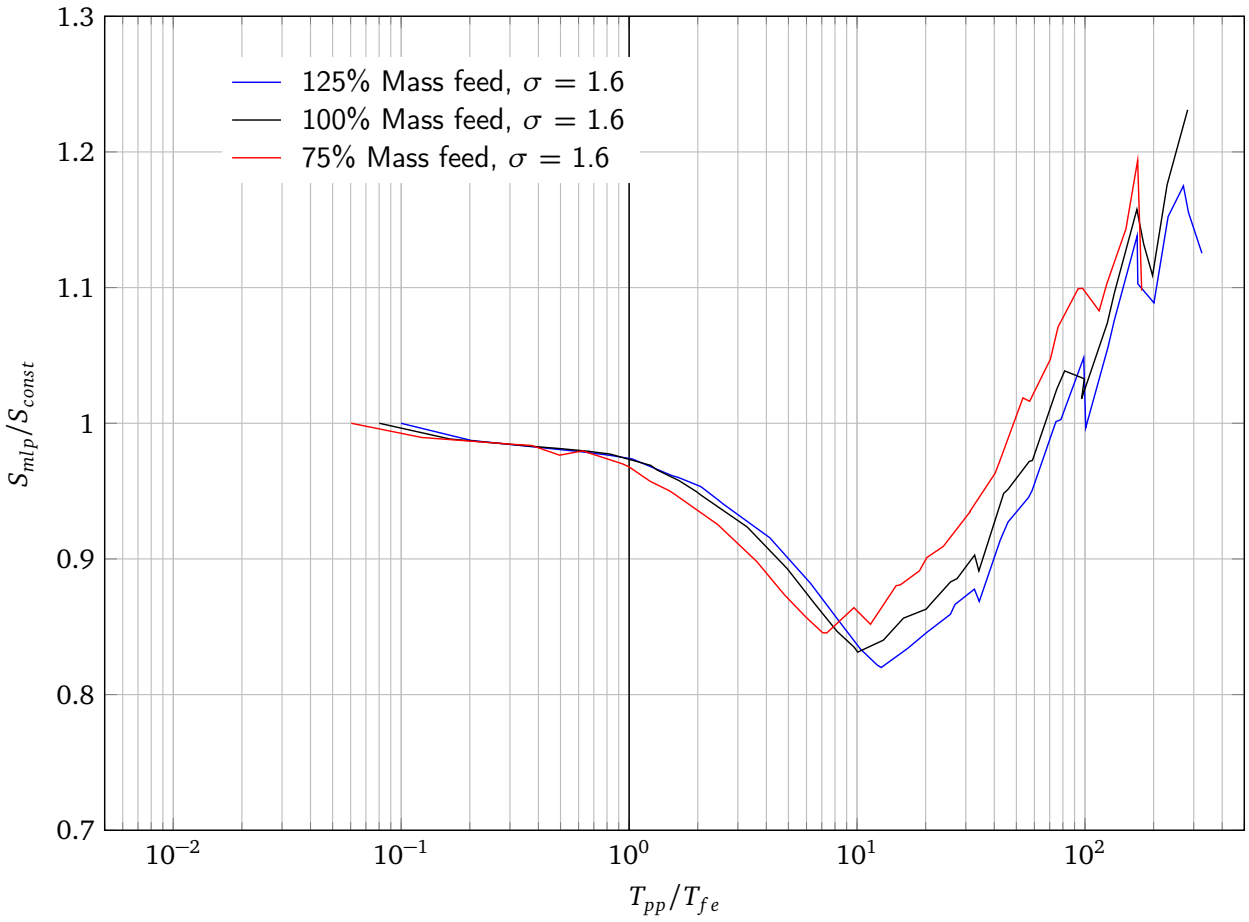

Figure S5: Effect of a 25% increased and 25% decreased total sediment feed on the equilibrium slope in the non-dimensionalized time scale. All simulations were executed with $\sigma = 1.6$.