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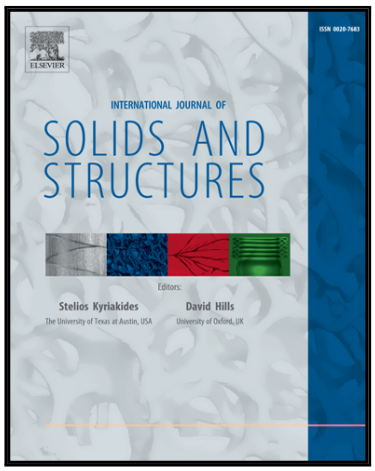

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Nathanaël Durr , Martin Sauer , Stefan Hiermaier

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ACCEPTED MANUSCRIPT

MESOSCALE INVESTIGATION OF DYNAMIC FRACTURE IN QUARTZITE AND SANDSTONE AND HOMOGENIZATION TO MACROSCALE

Nathanaël Durr[1*], Martin Sauer[1] and Stefan Hiermaier[1,2]

[1]Fraunhofer Institute for High-Speed Dynamics, Ernst-Mach-Institut, EMI, Eckerstrasse 4, 79104 Freiburg, Germany

[2]Albert-Ludwigs-Universität Freiburg, Department of Sustainable Systems Engineering –INATECH, Georges-Köhler-Allee 101, 79110 Freiburg, Germany

*Correspondence author's e-mail address: nathanael.durr@emi.fraunhofer.de

Nomenclature

C	Longitudinal wave speed
d	Longitudinal distance
E	Young's modulus
G_{exp}^{crit}	Experimental dynamic fracture energy
$\bar{G}_{exp}^{crit}$	Average of experimental G_{exp}^{crit} values
G_{macro}^{crit}	Macroscopic fracture energy
G_{meso}^{crit}	Mesoscopic fracture energy
ΔI	impulse transfer between two fragments
K	Isotropic bulk modulus
ΔL	Distance between the pseudo-RVE and the free end of the specimen
P	Pressure
$\bar{P}$	Volumetric average of pressure over the RVE
T_{exp}^{crit}	Experimental dynamic tensile strength
$\bar{T}_{exp}^{crit}$	Average of experimental T_{exp}^{crit} values
T_{macro}^{crit}	Macroscopic tensile strength
T_{meso}	Mesoscopic cohesive traction
T_{meso}^{crit}	Mesoscopic critical traction
Δt	Time span
t_{pb}	Pull-back time
t_{peak}	Instant of time at which U_{AC} reaches its peak value
U_{AC}	Free-end velocity measured by the accelerometer
$U_{bc}(t)$	Time-dependent velocity boundary condition
ΔU_{pb}	Pull-back velocity
V_{RVE}	Volume RVE
δ_{meso}	Mesoscopic separation
δ_{meso}^{crit}	Mesoscopic critical traction
δ_{meso}^{max}	Mesoscopic maximum separation along the elastic path
$\dot{\delta}$	Crack opening velocity
$\dot{\varepsilon}$	Strain rate
ρ	Density

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