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Homogenization of Viscoplastic Models of Monotone Type

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A homogenized material model can be used effectively for simulation, if the difference of the solutions of this model and the microscopic model converges to zero in a strong norm when the microstructure is scaled. Recently it has been showed for the quasistatic initial-boundary value problem with internal variables modelling an inelastic solid body Ω at small strain that this convergence holds in an averaged sense over phase shifts of the microstructure. Based on this result we construct an asymptotic solution, which converges to the solution of the microscopic problem in the $L^2(\Omega)$ -norm, thus avoiding the averaging.