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Calibrating a Shear-failure model using punch specimens in the SHPB apparatus ZEV LOVINGER, YEHEZKEL ASHUACH, RAFAEL — We are using a punch specimen on the split Hopkinson pressure bar (SHPB) apparatus to calibrate a shear-failure model for two Aluminum alloys. The tested specimen is a thin disc which is placed between punch and anvil adapters. We use 2D simulations of the entire SHPB set-up and compare the experimental strain-gauge measurements to our numerical gauges in the model. The straight forward procedure we developed consists of two stages: first, we fit a strength model based on the standard Hopkinson analysis and validate the model through simulations of the SHPB test, comparing the strain-gauge signals. At the second stage we use the validated strength model and calibrate the shear failure model parameters by fitting the fall-time of the transmitted signal. The fall time is found to be very sensitive to the failure parameters. Finally, we conducted FSP penetration tests to validate the failure model and found good comparison with our simulations.

Zev Lovinger
RAFAEL

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