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A VERY LOW STRAIN RATE RUPTURE EXPERIMENT

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There remains one crucial difference between laboratory rupture experiments and the real Earth, and it regards the strain rates involved, which are larger in the laboratory by some orders of magnitude. In order to study the importance of this factor, we have developed a new experimental technique which allows to reach in the laboratory strain rates comparable to the *in situ* ones. The samples are loaded through a four point bending constant configuration apparatus which has been custom designed and built for high stiffness. This one incorporates a low geared servocontrolled movement which allows to reach strain rates of $1 \times 10^{-8}\ s^{-1}$. This is used in a first stage to set the operational starting conditions conveniently close to the fracture threshold. In the second stage constant strain increases at a slow constant rate is achieved by slowly decreasing the temperature in the thermostatized chamber in which the apparatus is located, thus inducing a differential displacement on the piston and the cylinder of the appartus, which are machined from two alloys with different coefficients of thermal expansion. Strain rates of the order of $1 \times 10^{-11}\ s^{-1}$ on the specimen can be thus comfortably achieved. The waveforms of the acoustic emissions of the rupturing episodes are recorded by $1MHz$ accelerometers and acquired through a four channel $5MSamples/s$ card. Events are first of all identified and located, and preliminary results indicate that the scaling law in event size is closely followed.

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