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## Light emission and shock wave characteristics of metal wires exploded in water with small hydrostatic pressures

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In the application of reservoir stimulation, pulsed discharges may happen in a liquid environment with a quite high hydrostatic pressure (from several mega Pascal to a few tens of mega Pascal). It might be meaningful to investigate the behaviors of the wire explosion process under some hydrostatic pressures. Current and voltage waveforms were recorded by a Pearson coil and a North Star probe, respectively. In this study, copper wires and tungsten wires were exploded in water with 0.4 MPa and 0.8 MPa hydrostatic pressures. A photodiode and a calibrated time-integrated spectrometer were adopted to measure the light intensity and the spectra. Shock waves were obtained by a PVDF needle probe located 145 mm away from the source. The results revealed that environmental pressure could decrease the intensity of light emission. However, on the other hand, the pressure could increase the value of peak pressures. Nevertheless, it should also be pointed out that the conclusions could only be valid for the cases with small hydrostatic pressures.

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