EXTREME STATE OF WATER PRODUCED BY 
CONVERGING STRONG SHOCK WAVES 
GENERATED USING UNDERWATER ELECTRICAL 
WIRE ARRAY EXPLOSION 
Ya. E. Krasik, S. Efimov, L. Gilburd, D. Sheftman, 
O. Antonov, D. Shufer, V. Tz. Gurovich, G. Bazalitsky 

Physics Department, Technion, 32000 Haifa, Israel

Results of generation of extreme state of water in the vicinity of the implosion axis of converging strong cylindrical and spherical shock waves are reported. The shock wave was produced by underwater electrical explosion of cylindrical and spherical either Cu or Al wire arrays. A 10 kJ pulse generator with a current amplitude ≤ 500 kA and rise time of 350 ns was used to explode arrays with varying lengths, radii and number of wires. Hydrodynamic numerical simulations coupled with SESAME equation of state for water and the experimental data of the shock wave propagation, energy deposition rate to the array and light emission from the compressed water in the vicinity of the implosion axis were used to obtain the pressure, density and temperature profiles during the implosion. Dependences of the pressure in the vicinity of the implosion axes on the array radius and deposited linear energy density per unit length were obtained.