# THE SHAPE OF THE BLAST WAVE: STUDIES OF THE FRIEDLANDER EQUATION

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The time-histories of pressure, and other physical properties of blast waves, have a characteristic shape. Friedlander (1946) suggested a simple relationship, now known as the Friedlander equation, which accurately describes this characteristic shape over a wide range of overpressures. Introduction of one additional coefficient allows the modified Friedlander equation to describe blast wave time histories over an even wider range.

This paper explores the ranges over which the modified and un-modified Friedlander equations can be used to describe the various physical properties of blast waves. It also shows the application of these equations to blast wave radius-profiles at various times after detonation.

A number of the unique characteristics of the Friedlander equation are explored.

It has long been suggested that the simplicity of the equation indicates a fundamental relationship with the explosive process. This possibility is explored, and an explanation is presented, relating the spherical piston path that drives a centered explosion, to the Friedlander equation.

Freidlander, F. G, 1946, The diffraction of sound pulses. I. Diffraction by a semi-infinite plate, *Proc. Roy. Soc. Lond. A*, 186, 322-344.