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*Trace formula for differential operators of an arbitrary order*

**Abstract:**

An operator  $H = H_0 + V$  where  $H_0 = i^{-N}\partial^N$  ( $N$  is arbitrary) and  $V$  is a differential operator of order  $N - 1$  with coefficients decaying sufficiently rapidly at infinity is considered in the space  $L^2(\mathbb{R})$ . The goal of the paper is to find an expression for the trace of the difference of the resolvents  $(H - z)^{-1}$  and  $(H_0 - z)^{-1}$  in terms of the Wronskian of appropriate solutions to the differential equation  $Hu = zu$ . This leads to a representation for the perturbation determinant of the pair  $H_0, H$ .