

## **Spherical Combustion Layer in a TNT Explosion**

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A theoretical model of combustion in spherical TNT explosions at large Reynolds, Peclet and Damköhler numbers is described. A key feature of the model is that combustion is treated as material transformations in the Le Chatelier plane, rather than "heat release". In the limit considered here, combustion is concentrated on thin exothermic sheets (boundaries between fuel and oxidizer). The products expand along the sheet, thereby inducing vorticity on either side of the sheet that continues to feed the process. The results illustrate the linking between turbulence (vorticity) and exothermicity (dilatation) in the limit of fast chemistry— thereby demonstrating the controlling role that fluid dynamics plays in such problems.