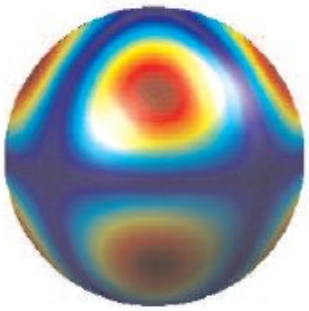
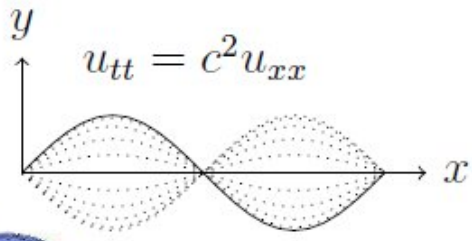
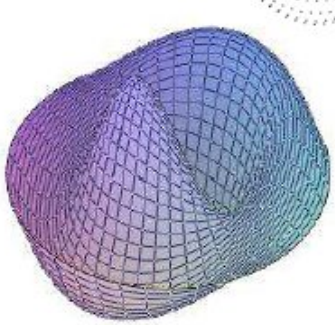
RUSSELL L. HERMAN

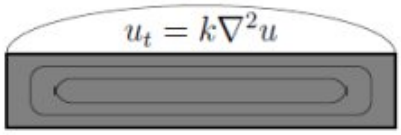
# A FIRST COURSE IN PARTIAL DIFFERENTIAL EQUATIONS

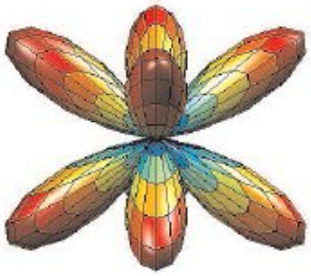


$$\int_V (\varphi \nabla^2 \chi - \chi \nabla^2 \varphi)\, dV = \oint_S (\varphi \nabla \chi - \chi \nabla \varphi) \cdot \hat{\mathbf{n}}\, dS$$





$$T(r,z,t) = T_b + \frac{8(T_i - T_b)}{\pi} \sum_{n=1}^{\infty} \sum_{m=1}^{\infty} \frac{\sin \frac{(2n-1)\pi z}{Z}}{(2n-1)} \frac{J_0(\frac{r}{a} j_{0m}) e^{-\lambda_{nm} kt}}{j_{0m} J_1(j_{0m})}$$

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This text has been reformatted from the original using a modification of the Tufte-book document class in LaTeX. See TUFTE-LATEX.GOOGLECODE.COM.

INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS by Russell Herman. Versions of these notes have been posted online since Spring 2005.
HTTP://PEOPLE.UNCW.EDU/HERMANR/PDE1/PDEBOOK

*January 2024*

# *Contents*

*Dedicated to those students who have endured previous versions of my notes.*