

kpfonts notes template

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A place for everything,
and everything in its place.

—Mother



I have always loved these boxes with pictures. They appropriately theme the notes. If you want to turn this off, just un-comment the `iffalse...fi` environment. Sometimes it is tricky to get the text to fit in this box properly, but you can adjust the parameters.



Description of notes

This template formats documents the way I prefer. For a simplified version, see `kpfonts_short.txt`. The description and status of these associated notes is color-coded as *complete* and *incomplete*.

- (a) *blahblah.pdf*: covers *blah blah blah*
- (b) *blahblahblah.pdf* discusses *blah blah blah blah*

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1 Governing equations

This is a section. If one doesn't like the section/subsection/subsubsection formatting, one can delete these headers as well as the `\tableofcontents`. Here is a centered aligned equation:

$$\nabla \cdot \mathbf{u} + \frac{\partial \rho}{\partial t} = 0 \quad (1)$$

$$\nabla P + \frac{\partial}{\partial t}(\rho \mathbf{u}) = 0 \quad (2)$$

Reference [1] is a review paper. Ref. [2] is a classic, and Ref. [3] is one of my favourite books ever.

2 Wave equation

Linearizing equations (1) and (2) and combining with an equation of state gives the wave equation of linear acoustic,

$$\nabla^2 P - \frac{1}{c_0^2} \frac{\partial^2 p}{\partial t^2} = \mathcal{O}(\epsilon^2)$$

This can also be written as

$$p = \mathcal{O}(\epsilon^2).$$

Here are some \TeX commands I always seem to forget: `\gtrsim`, `\lesssim`, `\stackrel{?}{=}`.

Concluding thoughts

Write your conclusions/thoughts here.

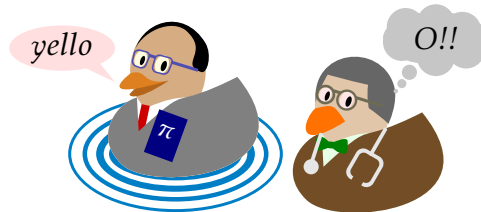
Appendix

An exercise for a batty. I like to include exercises here.

$$\underline{\underline{F}} = m \underline{\underline{a}}$$

Symbol	Quantity/Operation
i	complex unit
x	scalar
\mathbf{x}	column vector
\hat{x}	unit vector in direction of \mathbf{x}
\mathbf{x}^T	row vector
$\underline{\underline{X}}$	dyadic
$\underline{\underline{X}}^*$	complex conjugation
$\underline{\underline{X}}^T$	transposition
$\underline{\underline{X}}^\dagger$	Hermitian conjugate
\cdot	dot product
\times	cross product
\otimes	dyadic product

Table 1: Mathematical notation. x , \mathbf{x} , and $\underline{\underline{x}}$ are generic objects.



References

- [1] M. R. Haberman and M. D. Guild. “Acoustic metamaterials”. In: *Physics Today* 69.6 (2016), pp. 42–48.
- [2] P. M. Morse and K. U. Ingard. *Theoretical Acoustics*. McGraw-Hill, 1968.
- [3] D. J. Griffiths. *Introduction to Electrodynamics*. 3rd. Upper Saddle River, New Jersey: Pearson, 1999.

Acoustics only

- [1] M. R. Haberman and M. D. Guild. “Acoustic metamaterials”. In: *Physics Today* 69.6 (2016), pp. 42–48.

- [2] P. M. Morse and K. U. Ingard. *Theoretical Acoustics*. McGraw-Hill, 1968.

Electrodynamics only

- [3] D. J. Griffiths. *Introduction to Electrodynamics*. 3rd. Upper Saddle River, New Jersey: Pearson, 1999.