An introduction to the BEAMER class

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SCHOOL OF **MATHEMATICAL AND STATISTICAL SCIENCES**

Outline

Presentation tools

- Transparencies – out of fashion

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- PowerPoint (texpoint ?) – may have to use this if collaborating with others.

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- Latex – you may already have your paper written ...
  - slide class
  - Prosper
  - **Beamer**

Main Features

- ± Created like any other LaTex document.
- + The final output is a PDF file – easy to share. Uses *pdflatex*.
- + Structure: section, subsection, and table of contents.
- + Easy to create overlays and dynamic effects.
- + Themes allow you to change the appearance of your presentation.
- + Layout , colors, and fonts can easily be changed globally.

Help!

- Ask Renate to install Beamer (if not installed in your computer)
- There is a well written User's Guide (200 pages)
- There is also info on the department's website.
- The internet ...
- May look for a solution template (beamer/solutions/conference-talks/)

Creating a simple frame

```
\begin{frame} \frametitle{Help!}
 \begin{itemize}
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 \end{itemize}
 \transdissolve
\end{frame}
```

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Creating a simple frame with overlay

```
\begin{frame} \frametitle{Presentation tools}
  \begin{itemize}
     \item Transparencies -- out of fashion
     \item<2-> PowerPoint (texpoint ?) -- may have to use th
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     \begin{itemize}
         \item slide class
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         \item \color{red}{\bf Beamer}
     \end{itemize}
 \end{itemize}
\end{frame}
```

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More overlay specifications

```
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  \begin{itemize}
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     }
 \end{itemize}
\end{frame}
```

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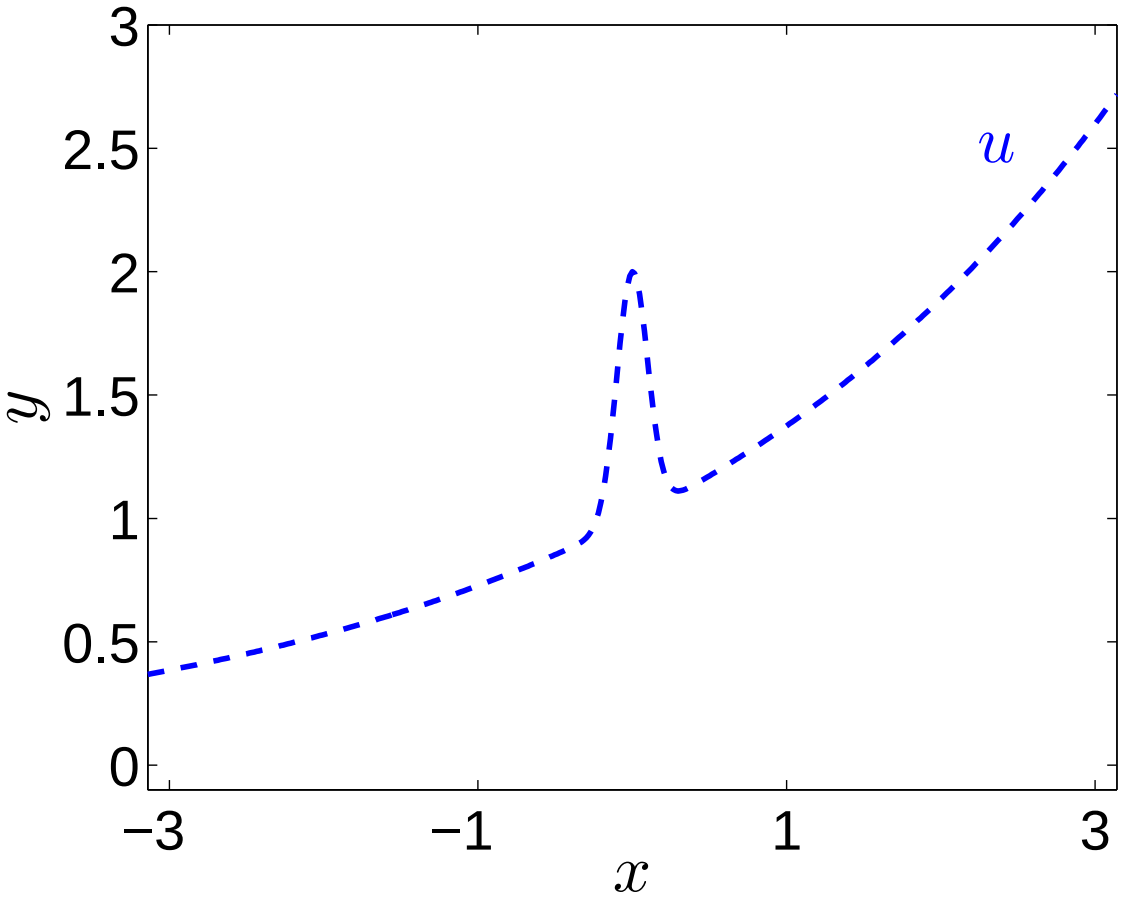
Graphs

```
\begin{frame} \frametitle{The Hybrid method: A simple
\begin{center}
\includegraphics<1>[height=6cm]{intro1.pdf}
\includegraphics<2>[height=6cm]{intro2.pdf}
\includegraphics<3>[height=6cm]{intro3.pdf}
\includegraphics<4>[height=6cm]{intro4.pdf}
\end{center}
\end{frame}
```

The Hybrid method: A simple example



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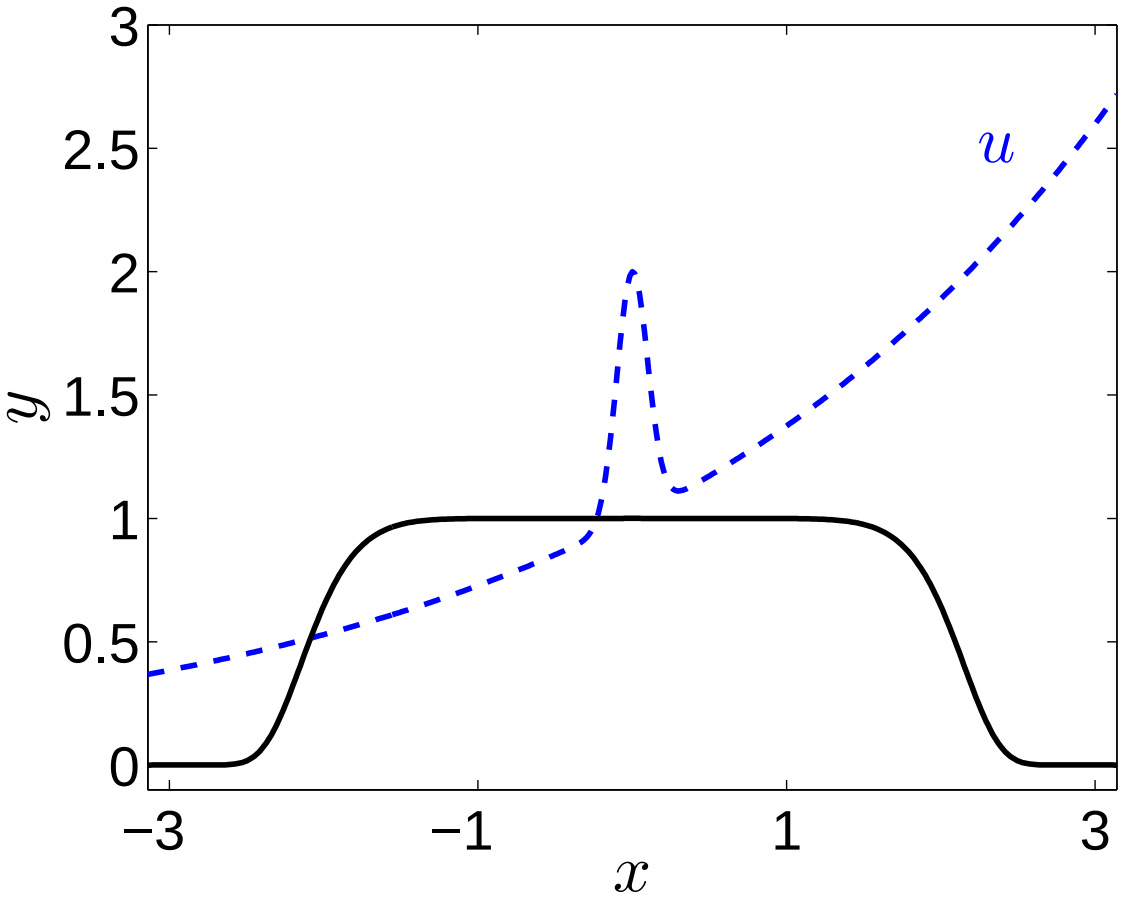

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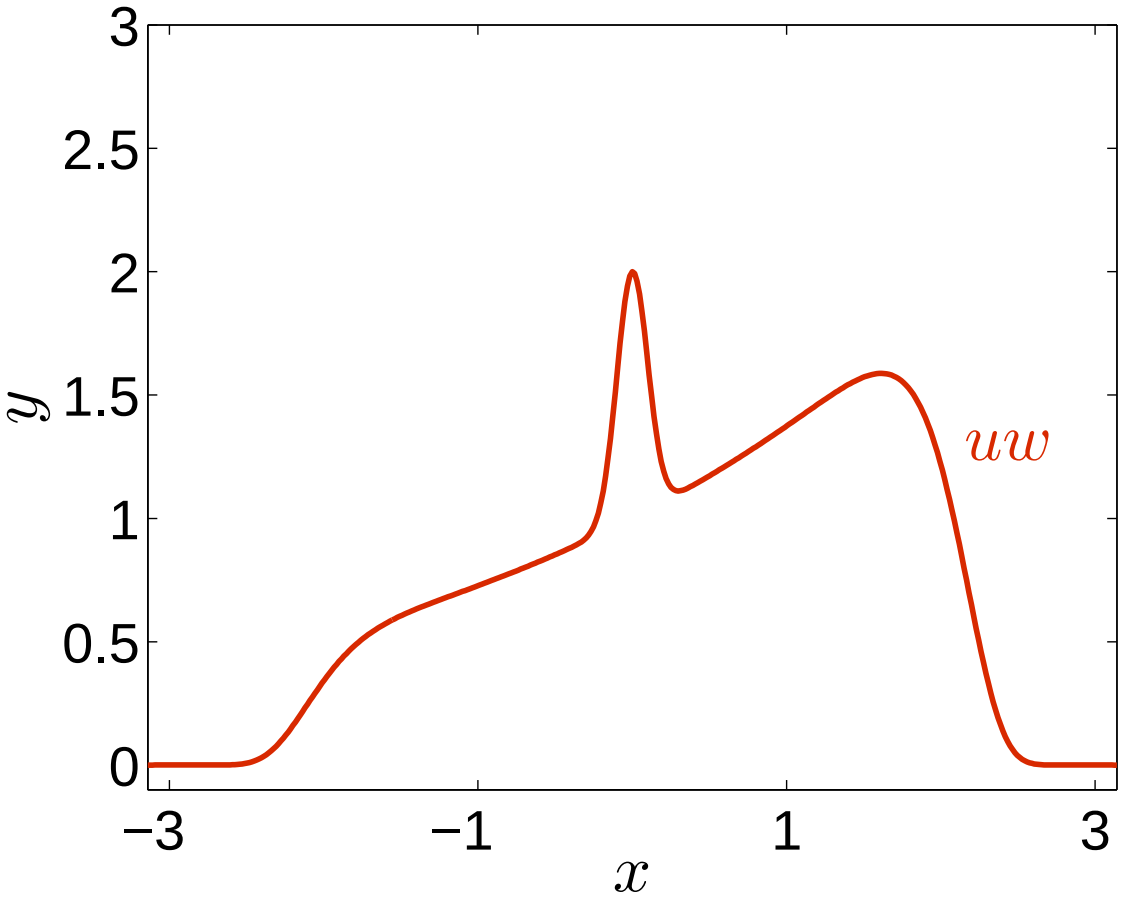

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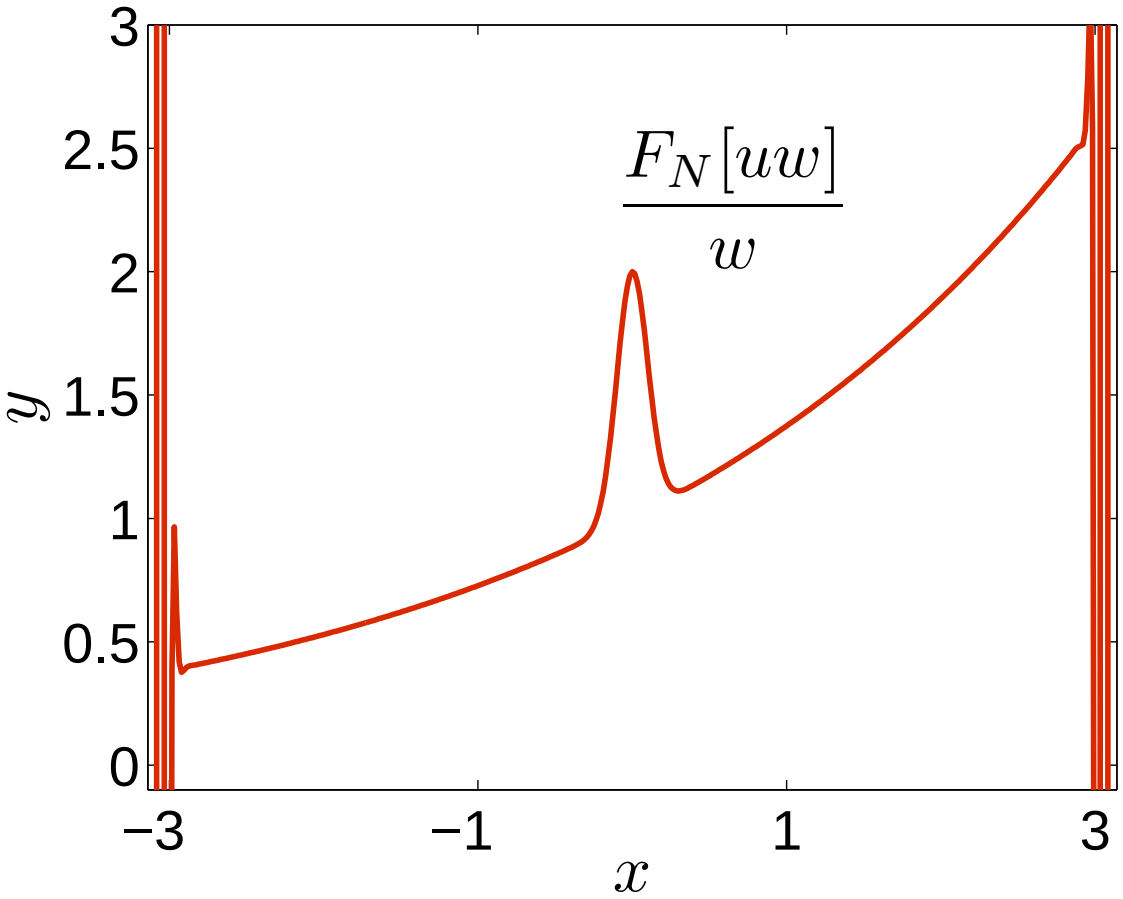
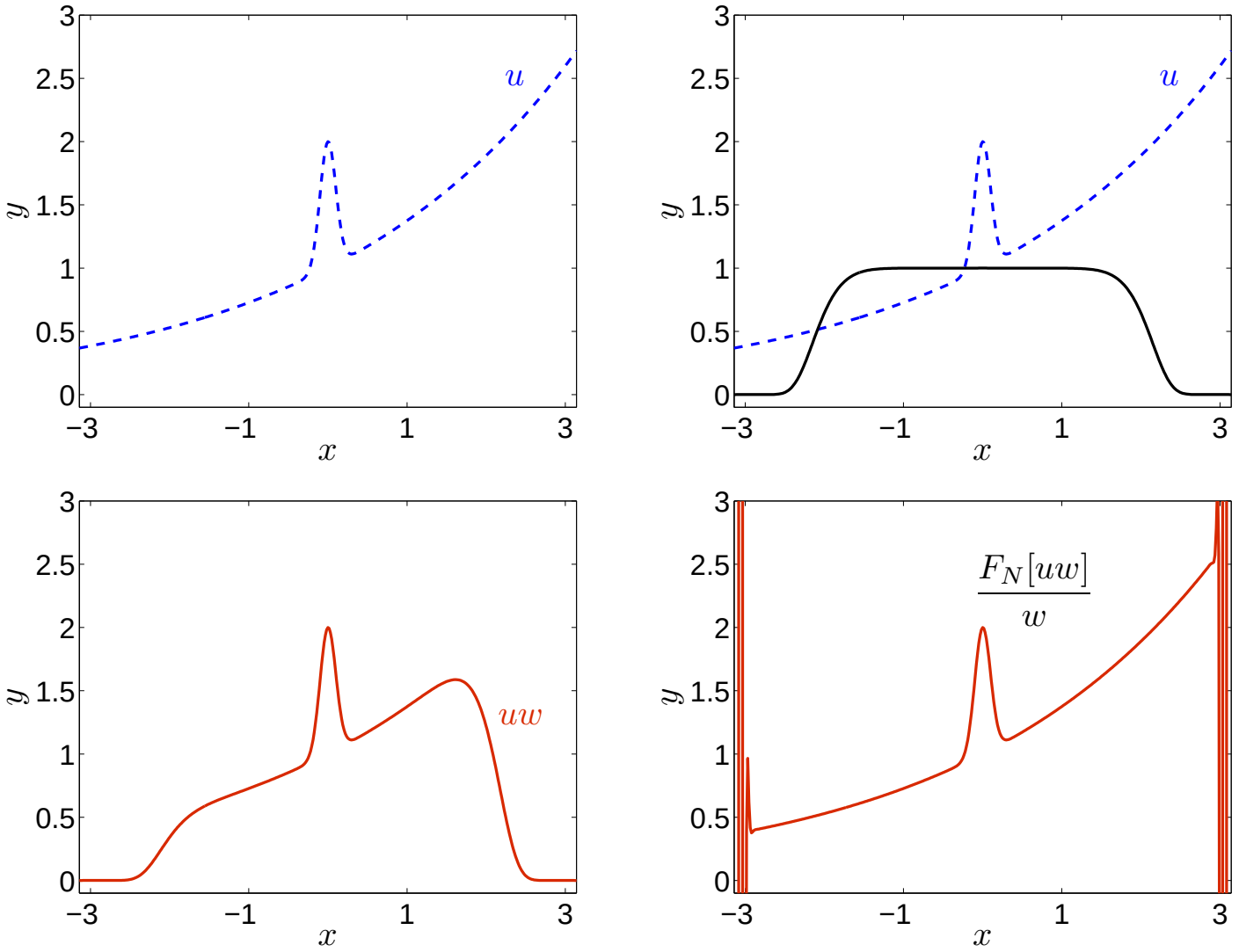


Four figures in one frame



Theorems

Accuracy depends on the analyticity of the product *uw*.

Theorem (Tadmor 1986)

Complex plane:

$$|f(z)| \leq M(\eta)$$

f is analytic inside the strip of width 2η

The error in a Fourier approximation of f is bounded by

$$\frac{M(\eta)}{\sinh(\eta)} \exp(-N\eta)$$

Error estimate

$|w(z)| < 10$ if

$$|\Im z| \le \eta = \pm\pi \left(\frac{\ln 10}{40}\right)^{1/(2\lambda)} \sin\left(\frac{\pi}{4\lambda}\right) \to \frac{\pi^2}{4\lambda} + O(1/\lambda^2)$$

$$\frac{M(\eta)}{\sinh(\eta)} \exp(-N\eta) \to \frac{40\lambda}{\pi^2} \exp(-\pi^2 N/(4\lambda))$$

Choosing $-\pi^2 N/(4\lambda) < -30$ leads to $\lambda = \pi^2 N/120 \approx 0.08N$.

A frame with a movie

```
\begin{frame}
  \frametitle{Wave equation in 2D - $100x100$ Grid}
   \movie[label=cells,width=9.5cm,
               height=7cm,poster,showcontrols,
               duration=30s]{}{wave_green.avi}
\end{frame}
```

Note: Movies currently won't play in Linux.