Title: Presentation with *CEL* template

Subtitle: An Introduction to CELbeamer.cls

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Overview

- **Basic Usage**

  Options
  Color Boxes

- **Frames**

  Title and Footer
  Grid Page for Hand-written Notes
  Footnotes

- **Other Tips**

  Citations
  Handout Mode
  Macros

Usages Options

The following options can be used by putting the `<option>` in the `\documentclass[<option>]{CELbeamer.cls}` command:

- `en` *(default)* for English, `de` for German
- `helvet` *(default)* for Helvetica font, `franklin` for Franklin Gothic font
- `bigfoot` *(default)* sets the footer font size as 12pt; `smallfoot` sets the footer font size as 11pt.
- `navbaron` to show the navigation bar
- `kitgrid` to show the grid of rows and columns

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- navbaron to show the navigation bar
- kitgrid to show the grid of rows and columns
- handout to create a handout version of the slides
- spaceforface to leave space for face in recording
- overviewatsection to show the table of contents at each section
- showsubsectionsatfirstoverview to show all subsections at the first overview

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Font Size Examples

Tiny text

Scriptsize text

Footnotesize text

Small text

Normal text

large text

Large text

LARGE text

huge text

Huge text

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Color Blocks

in the KIT Color Scheme

KIT

Greenblock
Standard (block)

Royalblueblock
= exampleblock

Redblock
= alertblock

Grayblock
Text

Lightgrayblock
Text

Blueblock
Text

Brownblock
Text

Purpleblock
Text

Cyanblock
Text

Yellowblock
Text

Lightgreenblock
Text

Orangeblock
Text

Contentblock

This is a content block without color.

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Color Boxes
with Filled Background

Standard box

Highlight box

Gray highlight box

Light gray highlight box

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Slide Layout via Column Split

The pre-defined lengths \kitcolumn, \kittwocolumns, ..., \kitsixcolumns can be used to create columns of different widths.

This is a three-column layout.
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna.

This is another three-column layout.
Lorem ipsum dolor sit amet, consectetuer adipiscing elit. Ut purus elit, vestibulum ut, placerat ac, adipiscing vitae, felis. Curabitur dictum gravida mauris. Nam arcu libero, nonummy eget, consectetuer id, vulputate a, magna.

Two column box

Two column box

Two column box

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Title
Subtitle

With frames with the option [t], the content is not vertically centered but started at the top edge.

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With frames without a title, the free space for title can be used for content.

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With frames with the option [plain], neither header nor footer are displayed.

Notes Page with Grid Lines

The command `\pagesNotes{<label>}{<subtitle of the note page>}` can be used to create a page with grid lines for notes, shown on the next slide.

`\refnotes<label>` creates a symbol linked to the page with notes.

Let's learn more about entropy!

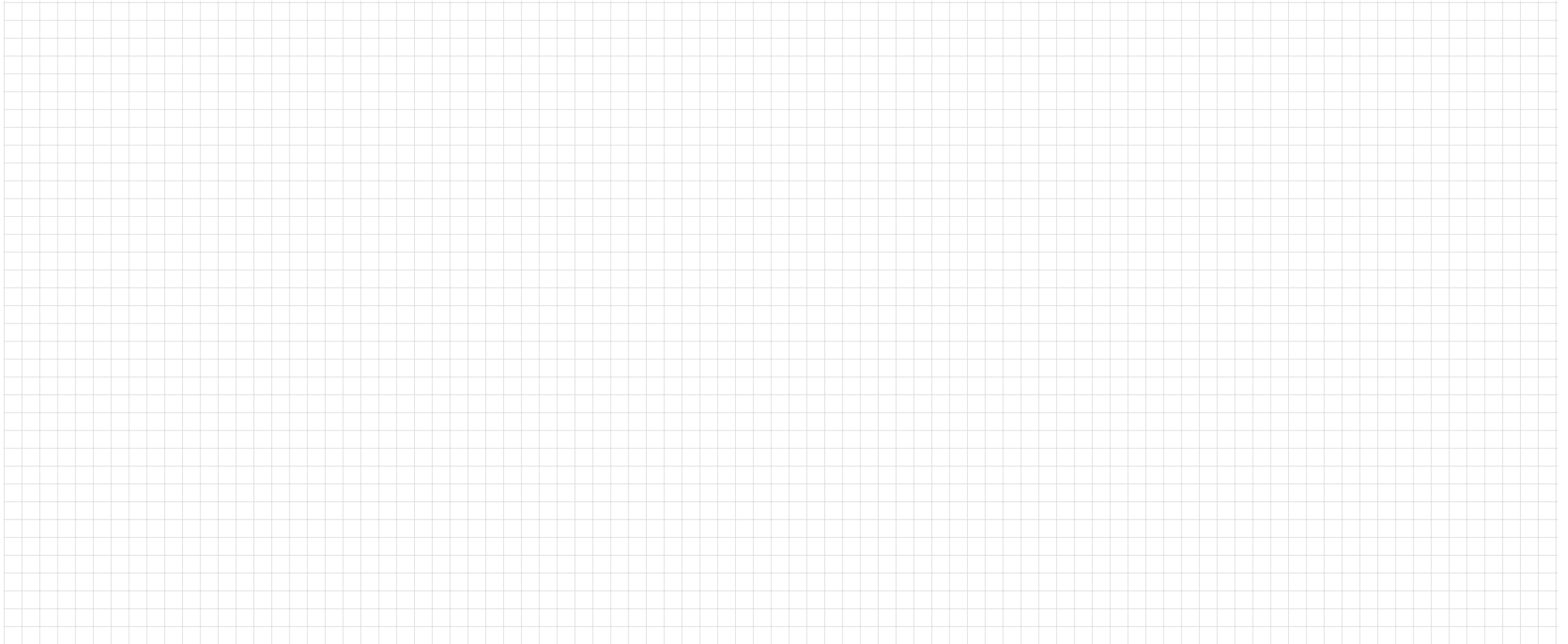Let's learn more about divergence!

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Notes

Entropy

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Notes

Divengence

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Footnotes

KIT
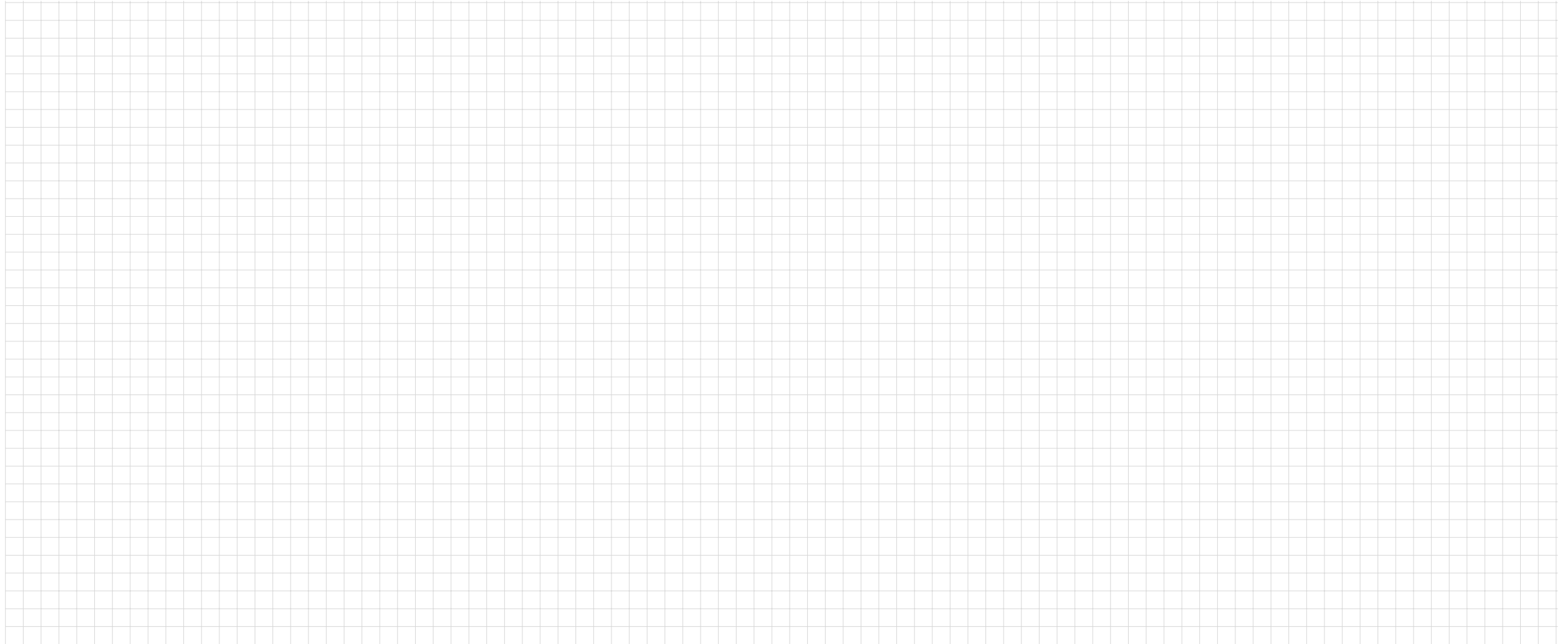
- This is a normal footnote[1].
- \nomarkfootnote creates a footnote without a mark in the text.
- This is another normal footnote[2].

---

[1]This is a normal footnote.
 This is a footnote without a mark.
[2]This is another normal footnote.

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Citations in Footnote using BibLaTeX

Citations in beamer were often dealed bypasting the full text.

The biblatex package enables citing from your .bib file.

Here are several examples of usage:

- Cite full text in footnote[3] by `\footfullcite`.

- If the mark is not wanted, combine `\nomarkfootnote` and `\fullcite`.

- Cite author and year in text Rode, Geiger, Chimmalgi, and Schmalen, 2023.

- Cite title in text "End-to-end deep learning of optical fiber communications."

- Use `\supercite` to cite the alphabetic bibkey [LHGW18; KCT+18].

For more usage please refer to Biblatex Cheat Sheet.

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[3]A. Rode, W. A. Gebrehiwot, S. Chimmalgi, and L. Schmalen, "Optimized geometric constellation shaping for Wiener phase noise channels with Viterbi-Viterbi carrier phase estimation," in *Proc. Eur. Conf. Opt. Commun. (ECOC)*, Glasgow, UK, Oct. 2023.

A. Rode, B. Geiger, S. Chimmalgi, and L. Schmalen, "End-to-end optimization of constellation shaping for Wiener phase noise channels with a differentiable blind phase search,", vol. 41, no. 12, pp. 3849–3859, Jun. 2023

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Cite in *CEL* Style

Cite the in text by `\citereference{<bibkey>}`. E.g.,

- End-to-end learning applied to optimize multidimensional constellations for IM/DD links **[KCT+18]**
- End-to-end learning of transceivers for the nonlinear Fourier transform **[GJDZ20]**
- Constellation optimization for the zero-dispersion channel **[LHGW18]**

Then add the references at the bottom of the page by `\addreference{<bibid>}` for single reference, or `\addreferences{<bibid><bibid>...<bibid>\stoppreferences}` for multiple references.

[KCT+18] B. Karanov *et al.*, "End-to-end deep learning of optical fiber communications,", vol. 36, no. 20, pp. 4843–4855, 2018

[GJDZ20] S. Gaiarin, R. Jones, F. Da Ros, and D. Zibar, "End-to-end optimized nonlinear fourier transform-based coherent communications," in *2020 Conference on Lasers and Electro-Optics (CLEO)*, IEEE, 2020, pp. 1–2

[LHGW18] S. Li, C. Häger, N. Garcia, and H. Wymeersch, "Achievable information rates for nonlinear fiber communication via end-to-end autoencoder learning," in *2018 European Conference on Optical Communication (ECOC)*, IEEE, 2018, pp. 1–3

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Handout Mode

Handout mode is activated by the option `handout` in the document class.

A frame with multiple animated slides will be shown on one slide in the handout version.

One can still control the number of slides of one frame in the handout version, e.g.,

- One: This will not be shown in the handout version.
- Two: This will not be shown in the handout version.

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- **One:** This is shown on the first slide of this frame in the handout version.

- **Two:** This is also shown on the first slide in the handout version.

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- **Two:** This is also shown on the first slide in the handout version.

- **Three:** This is shown on the second slide in the handout version.

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- **Two:** This is also shown on the first slide in the handout version.

- **Four:** This is also shown on the second slide in the handout version.

Predefined Macros

- **Schlagwort** for highlighting keywords
- An important thing ☞ for pointing out important things

Math macros

- $\coloneq$ $:=$ for defining a new variable, e.g., $a := b + c$
- $\mathtt{\backslash myspan}\{\cdot\}$ for span notation, e.g. $\langle \boldsymbol{a}, \boldsymbol{b}, \boldsymbol{c} \rangle$
- $\mathtt{\backslash ceil}\{\cdot\}$ $\lceil x \rceil$ for ceiling function, e.g., $\lceil 3.14 \rceil = 4$
- $\mathtt{\backslash floor}\{\cdot\}$ $\lfloor x \rfloor$ for floor function, e.g., $\lfloor 3.14 \rfloor = 3$
- $\mathtt{\backslash dd}$ for differential operator, e.g., $\int f(x)\,\mathrm{d}x$, $\frac{\mathrm{d}f(x)}{\mathrm{d}x}$
- $\mathtt{\backslash real}$ Re for real part, e.g., $\mathrm{Re}(z)$
- $\mathtt{\backslash imag}$ Im for imaginary part, e.g., $\mathrm{Im}(z)$

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Math Macros (Cont'd)

- `\sinc` $\mathrm{sinc}(x)$ for sinc function, e.g., $\mathrm{sinc}(x) = \frac{\sin(\pi x)}{\pi x}$

- `\rect` $\mathrm{rect}(x)$ for rectangular function, e.g., $\mathrm{rect}(x) = \begin{cases} 1 & |x| \leq \frac{1}{2} \\ 0 & \text{otherwise} \end{cases}$

Math symbols:

- `\cA`, $\cdots$ $\mathcal{A}, \mathcal{B}, \mathcal{C}, \cdots$ for calligraphic letters
- $\mathbf{0}, \boldsymbol{n}, \boldsymbol{\alpha}, \boldsymbol{M}, \boldsymbol{\mathcal{M}}$ for bold math symbols
- $\mathbb{N}, \mathbb{R}, \mathbb{Z}$ blackboard bold symbols for the sets of natural numbers, real numbers, and integers, respectively
- $\mathbb{F}, \mathbb{F}_q, \mathbb{F}_{q^m}$ for finite field
- $\mathsf{A}, \mathsf{B}, \mathsf{C}, \cdots$ sans-serif math letters, usually for naming instead of parameters in notations

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Backup Parts

Backup Parts

Slides that are inserted after \beginbackup do not count towards the total number of slides.

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KIT Color Palette

	100	90	80	70	60	50	40	30	25	20	15	10	5
kit-green													
kit-royalblue													
kit-blue													
kit-red													
kit-gray													
kit-orange													
kit-lightgreen													
kit-brown													
kit-purple													
kit-cyan													

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