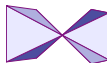


Presentations with Beamer and LyX

An Introduction to the Basics

The LyX Team

Version 2.3



Contents

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

- 1 Purposes
- 2 Segments of a presentation
- 3 The overlay concept
- 4 Specific environments
- 5 Short remarks on modes
- 6 Changing the look
- 7 And more ...

Purpose of the Beamer class

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

With the **Beamer** class, you can produce presentation slides,
which

- are visually highly customizable

Purpose of the Beamer class

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

With the **Beamer** class, you can produce presentation slides, which

- are visually highly customizable
- can be very well structured

Purpose of the Beamer class

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- can be very well structured
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Purpose of the Beamer class

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

With the **Beamer** class, you can produce presentation slides, which

- are visually highly customizable
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- can be constructed step-by-step (“overlay” concept)
- may contain different navigation paths (note that the slides contain all sorts of hyperlinks)

Purpose of the Beamer class

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- are visually highly customizable
- can be very well structured
- can be constructed step-by-step (“overlay” concept)
- may contain different navigation paths (note that the slides contain all sorts of hyperlinks)
- use L^AT_EX’s superb output quality

Purpose of the Beamer class

Presentations
with Beamer
and L^AT_EX

The L^AT_EX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

With the **Beamer** class, you can produce presentation slides, which

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- might embed multimedia content (audio, video)

Purpose of the Beamer class

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- may contain different navigation paths (note that the slides contain all sorts of hyperlinks)
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- might embed multimedia content (audio, video)
- can easily be transformed to accompanying material (such as an article-like handout)

Purpose of the Beamer class

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- might embed multimedia content (audio, video)
- can easily be transformed to accompanying material (such as an article-like handout)
- and much more ...

Purpose of this presentation

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

This presentation

- describes some basic features of [Beamer](#)
- especially how they can be used with LyX

For more general and comprehensive information on [Beamer](#) itself, please refer to the extensive class manual [1]

The global structure

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

A presentation usually consists of

- a title page
- slides that might be grouped to sections/parts
- an appendix with additional information, such as a bibliography

We describe these global segments in what follows.

The title page

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Within LyX, a title page is constructed by the layouts [Title](#), [Subtitle](#), [Author](#), [Institute](#), [Date](#) and [TitleGraphic](#).

- None of these elements is mandatory, but at least one must be given
- The order of insertion does not matter (the real order is defined in the [Beamer](#) theme)
- For [Title](#), [Subtitle](#), [Author](#), [Institute](#) and [Date](#), you can define “short” forms via [Insert ▷ Short Title/Date/...](#) These are used in the sidebar/heading (given the theme actually provides a sidebar/heading)
- If you select [Title \(Plain Frame\)](#) instead of [Title](#), the title page will have no sidebar or heading

Slides/Frames

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Slides are called “frames” in **Beamer**. Everything inside a frame is put on one slide (which itself might consist of sub-slides).

- Select the **Frame** style to start a frame
- The frame title is to be inserted in the “Frame title” inset, which is automatically inserted for new frames or can be manually inserted via **Insert▷Frame Title**
- Alternatively, you can also use the **FrameTitle** layout, which additionally offers a (rarely used) short frame title option, and, more importantly, overlay options
- A subtitle can be added via the **FrameSubtitle** layout
- Frame options (see [1] for the diverse options) are inserted via **Insert▷Frame Options**, overlay options via **Insert▷Overlay Specifications** and **Insert▷Default Overlay Specifications** (we explain later what this is)

Frames can be repeated

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Frames can be repeated fully or only in terms of selected sub-slides, multiple times at any later point of the presentation.

You just need to give the respective frame a label name via the frame option “label” (as done here).

Frames can be repeated

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Frames can be repeated fully or only in terms of selected sub-slides, multiple times at any later point of the presentation.

You just need to give the respective frame a label name via the frame option “label” (as done here).

Then you can repeat this frame by means of the [AgainFrame](#) layout later in the presentation. Just enter the label name in the [AgainFrame](#) layout and specify, if required, which sub-slides you want to be repeated via **Insert ▷ Overlay Specifications** (again, see below for the concept of “overlays”).

Keeping frames together

Use nesting!

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

- Note that all frame content, if the style is not **Frame**, must be nested to the frame environment (via **Edit ▷ Increase List Depth** or Alt+Shift+Right). This is done automatically if you insert new frame paragraphs.
- Nested content is marked by a red bar in the margin of the LyX workarea

- Non-nested content (such as this) will also be displayed in the presentation (on a separate slide), but not properly aligned

- So please avoid this

Separating frames

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Consecutive frames have to be separated from each other. This is done by means of the [Separator](#) inset, which can be produced by hitting return in an empty Standard paragraph right below the frame (see UserGuide, sec. 3.4.6).

Tip

There is a simple and much more convenient way to start a new frame: Issue **Insert▷Separated Frame Below** (undefined if you are in a non-nested [Frame](#) paragraph, or Alt+P Shift+Return, respectively, if you are in a nested paragraph within the frame). If you are in the frame heading, **Insert▷Separated Frame Above** inserts a new, properly separated frame above the current one!

Frames can be repeated

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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Proof.

Here's the proof! (This text is only shown on sub-slide 3 which is itself only shown when this frame is repeated later on) ☐

Special frame types

LyX provides two special frame types:

- 1 **Frame (plain)** is a frame without a sidebar/header (such as this one). This is useful for slides with much content/wide tables
- 2 **Frame (fragile)** is to be used if the frame consists of “fragile” content, especially verbatim stuff such as program listings

If you want a fragile plain frame, pass the option “plain” to a fragile frame or the option “fragile” to a plain frame.

Sectioning a presentation

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

- To group frames, you can use the usual sectioning commands ([Section](#), [Subsection](#) etc.)
- These are shown in the table of contents, the sidebar/header (depending on the theme) and the article output (for “article” see below, the section on “modes”)

Parts have special meaning

Presentations
with Beamer
and L^AT_EX

The L^AT_EX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

- You can also divide your presentation into **Parts**. Note, however, that parts behave differently in **Beamer** than in other document classes: a part is considered to be “a little ‘talk of its own’ with its own table of contents, its own navigation bars, and so on.” [1, sec. 10.3]
- This means, for instance, that if you use parts, the table of contents will only list the sections and subsections of the part that contains this table of contents, and the sidebar/header will also only show the sections of the current part.

Re-arranging frames

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Tip

Did you know that you can easily move and re-arrange whole frames via the outline (**View ▷ Outline Pane**)?

Also, you can navigate to a specific frame via the **Navigate** menu!

The appendix

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

- Appendices might be useful for additional/reserve material. The appendix is part of the presentation, but not shown in the table of contents/sidebar/header
- An appendix is inserted as usual in LyX:
 - Use **Document ▷ Start Appendix Here** at the position where the appendix should begin
- Typical content of the appendix is the bibliography
 - You insert it as in all other LyX classes, via the **Bibliography** style (see the bibliography at the end of this presentation as an example)
 - Note that you can also use BibTeX, although not all BibTeX styles are prepared to work with **Beamer**

What are overlays?

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Basically, the overlay concept allows to change the slide content dynamically. You can uncover things/text piecewise, fade out content, highlight things, replace text, images etc.

What are overlays?

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- Overlays are useful to build up slides as you speak

What are overlays?

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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What are overlays?

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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What are overlays?

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- And they help your audience to follow you
- So use overlays! Really, use them!

What are overlays?

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- And they help your audience to follow you
- So use overlays! Really, use them!

Overlay types

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Beamer provides many different overlay types. The most important ones are:

Hidden content: Stuff that is completely invisible up to a point

Covered content: Stuff that is faded out (not completely invisible)

Highlighted content: Stuff that is somehow emphasized at a certain point

We give examples for these types in what follows, but begin with some general remarks on overlay possibilities

General overlay/action possibilities

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Many **Beamer** elements provide overlay settings. Basically, you can define on which sub-slide(s) a given content appears (“2”, “2-4”, “3-”, “1,3” etc.), or in which output mode (“presentation”, “article” etc.)

- In LyX, these settings are generally accessible via **Insert ▷ Overlay Specifications** or **Insert ▷ Action Specifications**

General overlay/action possibilities

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- In LyX, these settings are generally accessible via **Insert ▷ Overlay Specifications** or **Insert ▷ Action Specifications**

Definition

“Action” is a more general concept, which does not only include what we have called “overlays” (“on which sub-slide[s] is this to be shown/hidden/highlighted”), but also tasks such as “only show this in the presentation, not on the handout” or “show this on the second screen only” (so-called “modes”).

General overlay/action possibilities

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- In LyX, these settings are generally accessible via **Insert ▷ Overlay Specifications** or **Insert ▷ Action Specifications**

Note to the L^AT_EX aficionados

The mentioned overlay/action settings conform to those command/environment options embraced by $\langle \dots \rangle$ and $[\langle \dots \rangle]$ in the L^AT_EX output.

Note that LyX adds those braces on export, so you must not enter them yourself. In other words, enter “1” or “+” to the overlay/action insets, not “ $\langle 1 \rangle$ ” or “ $[\langle + \rangle]$ ”!

An example

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Take for example a quote. In a **Quote** environment, you can specify the overlay settings via **Insert ▷ Overlay Specifications**. If you do this and enter “2”, the quote will only appear on (sub-)slide 2:

This is how the concept works, basically.

An example

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Take for example a quote. In a **Quote** environment, you can specify the overlay settings via **Insert ▷ Overlay Specifications**. If you do this and enter “2”, the quote will only appear on (sub-)slide 2:

*Fear no more the heat o' the sun
Nor the furious winter's rages
Thou thy worldly task hast done
Home art gone, and ta'en thy wages*

This is how the concept works, basically.

Covering vs. hiding

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

The difference between “covering” and “hiding” is that hidden content is treated as if it isn’t there, while covered content is just covered (and the space is reserved). If we would have hidden the quote on the last slide and not covered, it would only have taken space on appearance:
You can see how this text moves when the quote is un-hidden.

Covering vs. hiding

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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*Fear no more the heat o' the sun
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You can see how this text moves when the quote is un-hidden.

Coverage degrees

Presentations
with Beamer
and L^AT_EX

The L^AT_EX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Beamer offers several degrees of “coverage”, which can be set via the command `\setbeamercovered` either globally (for the whole presentation) or locally (e. g. for a single frame, as here). By default, content is completely covered. In “transparent” mode, you can see covered text greyed-out:

*Fear no more the heat o' the sun
Nor the furious winter's rages
Thou thy worldly task hast done
Home art gone, and ta'en thy wages*

Check the Beamer manual for more possibilities.

Coverage degrees

Presentations
with Beamer
and L^AT_EX

The L^AT_EX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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*Fear no more the heat o' the sun
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Check the [Beamer](#) manual for more possibilities.

Default overlay/action specifications vs. (normal) overlay/action specifications

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

- For some environments (such as lists and also frames), you can set “default specifications” additionally to normal overlay/action specifications (or in the case of lists: “overlay specifications” for the whole list and “item overlay specifications” for singular items)
- Default specifications apply to all content of the given environment, if not individually specified otherwise
- They use a placeholder syntax. E. g., “+(1)-” will uncover all items in a list step by step (with a start offset of 1) if they have no individual item specification:

- Always

Please consult the [Beamer](#) manual for details on this syntax.

Default overlay/action specifications vs. (normal) overlay/action specifications

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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 - One
 - Always

Please consult the [Beamer](#) manual for details on this syntax.

Default overlay/action specifications vs. (normal) overlay/action specifications

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- Default specifications apply to all content of the given environment, if not individually specified otherwise
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 - One
 - Two
 - Always

Please consult the [Beamer](#) manual for details on this syntax.

Default overlay/action specifications vs. (normal) overlay/action specifications

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- Default specifications apply to all content of the given environment, if not individually specified otherwise
- They use a placeholder syntax. E. g., “+(1)-” will uncover all items in a list step by step (with a start offset of 1) if they have no individual item specification:
 - One
 - Two
 - Three
 - Always

Please consult the [Beamer](#) manual for details on this syntax.

Default overlay/action specifications vs. (normal) overlay/action specifications

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

This frame uses a specific default overlay specification which causes each overlay-aware paragraph ...

- ... or list item ...

Default overlay/action specifications vs. (normal) overlay/action specifications

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

This frame uses a specific default overlay specification
which causes each overlay-aware paragraph ...

- ... or list item ...
- ... to appear ...

Default overlay/action specifications vs. (normal) overlay/action specifications

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

This frame uses a specific default overlay specification
which causes each overlay-aware paragraph ...

- ... or list item ...
- ... to appear ...
- ... on a subsequent sub-slide ...

Default overlay/action specifications vs. (normal) overlay/action specifications

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

This frame uses a specific default overlay specification which causes each overlay-aware paragraph ...

- ... or list item ...
- ... to appear ...
- ... on a subsequent sub-slide ...

A block

... one after the other

Default overlay/action specifications vs. (normal) overlay/action specifications

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

And this frame uses a specific default overlay specification ...

- ... which causes each overlay-aware list item ...
- ... to be highlighted ...
- ... on respective sub-slides

Default overlay/action specifications vs. (normal) overlay/action specifications

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

And this frame uses a specific default overlay specification ...

- ... which causes each overlay-aware list item ...
- ... to be highlighted ...
- ... on respective sub-slides

Default overlay/action specifications vs. (normal) overlay/action specifications

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

And this frame uses a specific default overlay specification ...

- ... which causes each overlay-aware list item ...
- ... to be highlighted ...
- ... on respective sub-slides

Pause

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

The **Pause** layout lets you mark a point where all following content will be covered (by default for one slide, with regard to the content preceding the pause):

Pause

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

The **Pause** layout lets you mark a point where all following content will be covered (by default for one slide, with regard to the content preceding the pause):

After first pause

By default, consecutive pauses also end consecutively.

Via **Insert ▷ Pause Number**, however, you can specify a specific sub-slide at which the given pause ends, independent from the number of pauses inserted before this one.

Pause

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

The **Pause** layout lets you mark a point where all following content will be covered (by default for one slide, with regard to the content preceding the pause):

After first pause

After second pause

By default, consecutive pauses also end consecutively.

Via **Insert ▸ Pause Number**, however, you can specify a specific sub-slide at which the given pause ends, independent from the number of pauses inserted before this one.

Paragraph-wide overlays

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Beamer and LyX provide you with paragraph layouts whose purpose it is to show/hide whole paragraphs or sequences of paragraphs on specific slides. These are particularly:

as demonstrated here.

Paragraph-wide overlays

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Beamer and LyX provide you with paragraph layouts whose purpose it is to show/hide whole paragraphs or sequences of paragraphs on specific slides. These are particularly:
The **Uncovered** layout which uncovers all content on the specified slides ...

- ... including nested paragraphs of other layout.

as demonstrated here.

Paragraph-wide overlays

Presentations
with Beamer
and L^AT_EX

The L^AT_EX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Beamer and L^AT_EX provide you with paragraph layouts whose purpose it is to show/hide whole paragraphs or sequences of paragraphs on specific slides. These are particularly:
The **Uncovered** layout which uncovers all content on the specified slides ...

- ... including nested paragraphs of other layout.

The **Only** layout which un-hides content (note again how the surrounding text “moves” when this gets visible).

as demonstrated here.

Paragraph-wide overlays

Presentations
with Beamer
and L^AT_EX

The L^AT_EX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Beamer and L^AT_EX provide you with paragraph layouts whose purpose it is to show/hide whole paragraphs or sequences of paragraphs on specific slides. These are particularly:
The **Uncovered** layout which uncovers all content on the specified slides ...

- ... including nested paragraphs of other layout.

The **Only** layout which un-hides content (note again how the surrounding text “moves” when this gets visible).

And the **Overprint** environment which lets you enter ... as demonstrated here.

Paragraph-wide overlays

Presentations
with Beamer
and L^AT_EX

The L^AT_EX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Beamer and L^AT_EX provide you with paragraph layouts whose purpose it is to show/hide whole paragraphs or sequences of paragraphs on specific slides. These are particularly:

The **Uncovered** layout which uncovers all content on the specified slides ...

- ... including nested paragraphs of other layout.

The **Only** layout which un-hides content (note again how the surrounding text “moves” when this gets visible).

... alternative text taking a specific space on specified slides.
as demonstrated here.

Inline overlays

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Beamer also supports inline overlays for text parts (as opposed to whole paragraphs), which are accessible via **Edit ▸ Text Style** in LyX:

- You can **uncover** text on specific slides
- You can make **visible** (which makes a difference to “uncover” only with “transparent” coverage setting, as used locally on this slide)
- You can show **only** on specific slides
- You can make text **invisible**
- And you can show **alternative** text

As for the paragraph layouts, the overlay settings can be accessed via the **Insert** menu.

Inline overlays

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- And you can show **alternative** text

As for the paragraph layouts, the overlay settings can be accessed via the **Insert** menu.

Inline overlays

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Beamer also supports inline overlays for text parts (as opposed to whole paragraphs), which are accessible via **Edit ▸ Text Style** in LyX:

- You can **uncover** text on specific slides
- You can make text **visible** (which makes a difference to “uncover” only with “transparent” coverage setting, as used locally on this slide)
- You can show **only** on specific slides
- You can make text **invisible**
- And you can show **alternative** text

As for the paragraph layouts, the overlay settings can be accessed via the **Insert** menu.

Inline overlays

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

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- You can **uncover** text on specific slides
- You can make text **visible** (which makes a difference to “uncover” only with “transparent” coverage setting, as used locally on this slide)
- You can show text **only** on specific slides
- You can make text **invisible**
- And you can show **alternative** text

As for the paragraph layouts, the overlay settings can be accessed via the **Insert** menu.

Inline overlays

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Beamer also supports inline overlays for text parts (as opposed to whole paragraphs), which are accessible via **Edit ▸ Text Style** in LyX:

- You can **uncover** text on specific slides
- You can make text **visible** (which makes a difference to “uncover” only with “transparent” coverage setting, as used locally on this slide)
- You can show text **only** on specific slides
- You can make **invisible**
- And you can show **alternative** text

As for the paragraph layouts, the overlay settings can be accessed via the **Insert** menu.

Inline overlays

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Beamer also supports inline overlays for text parts (as opposed to whole paragraphs), which are accessible via **Edit ▸ Text Style** in LyX:

- You can **uncover** text on specific slides
- You can make text **visible** (which makes a difference to “uncover” only with “transparent” coverage setting, as used locally on this slide)
- You can show text **only** on specific slides
- You can make **invisible**
- And you can show different text

As for the paragraph layouts, the overlay settings can be accessed via the **Insert** menu.

Overlay-aware commands

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Many “inline” commands (also to be found at **Edit ▷ Text Style**) are overlay-aware.

- Thus, you can make for instance text on specific slides emphasized, bold, shown in alert or structure color.

Overlay-aware commands

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Many “inline” commands (also to be found at **Edit ▷ Text Style**) are overlay-aware.

- Thus, you can make for instance text on specific slides *emphasized*, bold, shown in alert or structure color.

Overlay-aware commands

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Many “inline” commands (also to be found at **Edit ▷ Text Style**) are overlay-aware.

- Thus, you can make for instance text on specific slides emphasized, **bold**, shown in alert or structure color.

Overlay-aware commands

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Many “inline” commands (also to be found at **Edit ▷ Text Style**) are overlay-aware.

- Thus, you can make for instance text on specific slides emphasized, bold, shown in **alert** or structure color.

Overlay-aware commands

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Many “inline” commands (also to be found at **Edit ▷ Text Style**) are overlay-aware.

- Thus, you can make for instance text on specific slides emphasized, bold, shown in alert or **structure** color.

Overlay-aware commands

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Many “inline” commands (also to be found at **Edit ▷ Text Style**) are overlay-aware.

- Thus, you can make for instance text on specific slides emphasized, bold, shown in alert or structure color.

Tip

Use these Emphasize and Bold insets (instead of the usual respective font settings) also if you do not need overlay specifications. Due to the way emphasized and bold is defined in **Beamer**, normal emphasizing and boldface can lead to L^AT_EX errors, e. g. when used in section headings.

Specific environments

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Specific environments, particularly suited for presentations are:

- Diverse “blocks”
- Theorem-style environments
- Columns

We sketch them briefly in what follows.

Blocks

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Blocks can contain all sorts of information. We used them here for “tips” and “hints”. The class provides 3 pre-defined blocks with different look:

Blocks

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Blocks can contain all sorts of information. We used them here for “tips” and “hints”. The class provides 3 pre-defined blocks with different look:

Block

A general-purpose block

Blocks

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Blocks can contain all sorts of information. We used them here for “tips” and “hints”. The class provides 3 pre-defined blocks with different look:

Block

A general-purpose block

Example Block

A block for “examples”

Blocks

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Blocks can contain all sorts of information. We used them here for “tips” and “hints”. The class provides 3 pre-defined blocks with different look:

Block

A general-purpose block

Example Block

A block for “examples”

Alert Block

And an “alert” block for important remarks.

Handling Blocks

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

- In LyX, blocks have a similar user interface to frames, which means that
 - Content inside blocks needs to be nested (if the paragraph layout is not [Block](#))
 - Consecutive blocks of the same type must be separated by the [Separator](#) paragraph style
- Blocks are overlay-aware

Handling Blocks

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

- In LyX, blocks have a similar user interface to frames, which means that
 - Content inside blocks needs to be nested (if the paragraph layout is not [Block](#))
 - Consecutive blocks of the same type must be separated by the [Separator](#) paragraph style

Tip

Use **Edit ▶ Start New Environment** (undefined) to quickly start a new block from within a previous block!

- Blocks are overlay-aware

Theorem-style environments

(Theorem, Corollary, Definition, Definitions, Example, Examples, Fact, Proof)

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Theorems look similar to blocks in the output, but they have a fixed title (depending on the type).

Theorem

This is a theorem!

Fact

This is a fact!

Theorem-style environments

(Theorem, Corollary, Definition, Definitions, Example, Examples, Fact, Proof)

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Theorems look similar to blocks in the output, but they have a fixed title (depending on the type).

Theorem

This is a theorem!

Fact

This is a fact!

Via **Insert** ▶ **Additional Theorem Text**, you can add some extra text to this fixed title

Example (a bad one!)

An example with additional text (brackets added automatically)

Columns

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Sometimes it is useful to divide a presentation into columns

To do this, first select
Columns (note the
plural) to start the
columns

Columns

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Sometimes it is useful to divide a presentation into columns

To do this, first select
Columns (note the
plural) to start the
columns

And then, in the
following paragraph,
select **Column** (singular)
to start a specific column

Columns

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Sometimes it is useful to divide a presentation into columns

To do this, first select
Columns (note the
plural) to start the
columns

And then, in the
following paragraph,
select **Column** (singular)
to start a specific column

Note:

- In the **Column** (singular) environment, you need to specify the width using \LaTeX syntax (but also something like “3.5cm” will work)
- Any (singular) **Column** must be nested to the (plural) **Columns**. Likewise, column content can be any paragraph style that is nested to a singular **Column**

Modes

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

In **Beamer** terms, a “mode” is a specific output route. There are several modes for different purposes. We just want to highlight three:

- 1 The “beamer” mode
- 2 The “presentation” mode
- 3 The “article” mode

The beamer mode is the default. Unless explicitly specified otherwise, your **Beamer** document is in “beamer” mode.

Switching Modes

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

However, you can switch document parts, frames, headings and all “action”-aware environments to a different mode. For instance, we have switched this frame to “presentation” mode.

- What does this mean?
 - It means that this frame will only be visible in the presentation, not in the accompanying “article”, if you produce such an article (we will elaborate on this a bit below)

So what?

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

This is actually pretty useful! You can set up a single document and produce both a presentation and – using the article mode – a handout.

- And we mean a *real*, useful handout, not one of those scaled slide printouts that are so common nowadays (but if you insist, you can produce one of those as well)
- Modes allow you to add extra text to the handout or hide parts from it
- You can use for instance different graphics for the presentation and the handout
- and so on ...

Examples

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

As said, many elements are mode-aware.

- You can show particular text only in the presentation via **Edit ▷ Text Style ▷ Only**
- Or put all sorts of complex contents via **Insert ▷ Custom Insets ▷ PresentationMode** in an inset that will only be output in presentation mode
- Or you can define that an *emphasizing* should only apply to the presentation, a bold face only to article
- You can also show section headings or frame titles/subtitles only in the presentation/article (like we do for the “Contents” and “References” frame titles in this presentation)
- And much more of this sort ...

Setting up an article

Presentations
with Beamer
and L^AT_EX

The L^AT_EX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Setting up a beamer article with L^AT_EX is easy.

- Just create a new document with the class [Beamer Article \(Standard Class\)](#) or [Beamer Article \(KOMA-Script\)](#)
- Then add the presentation to this document as a child (via [Insert ▷ File ▷ Child Document. . .](#))
- And that's it. Now you can produce the handout and the presentation by compiling one of these two documents, while you only need to edit one, namely the presentation

Check out the accompanying beamer-article example document for this presentation. You can find it in the same folder as this document.

Themes

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

- **Beamer** presentations are themeable. Themes determine the colors used, the macro structure (use of sidebars, headlines etc.), the fonts, the look of list items, blocks and in general the whole look and feel of a presentation
- **Beamer** itself ships a number of different-looking themes to chose from (we use the “Berkeley” theme in this presentation; see **Document** ▶ **Settings** ▶ **LaTeX Preamble** for how we activated and slightly tweaked the theme)
- In addition to this standard set, you can get more themes from CTAN and other places at the Internet
- If you still are not satisfied or if you need a theme matching to your University’s or company’s corporate design, the **Beamer** manual [1] explains how you can setup your own theme

Themes can be modified

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

But you do not need to write a theme from scratch if you want to alter the look.

- Existing themes can be modified both in details and in major areas (such as the coloring)
- Consult the [Beamer](#) manual [1] for details

... much more!

Presentations
with Beamer
and LyX

The LyX Team

Purposes

Segments of a
presentation

The overlay
concept

Specific
environments

Short remarks
on modes

Changing the
look

And more ...

Note that [Beamer](#) can do much more than we have described here. The [Beamer](#) manual [1] provides a comprehensive documentation.

Also, have a look at the [Beamer](#) examples and templates shipped with LyX!

References

Presentations
with Beamer
and L^AT_EX

The L^AT_EX Team

Appendix



Tantau, Till et al.:

The beamer class.

[https://ctan.org/tex-archive/macros/latex/
contrib/beamer/doc/beameruserguide.pdf](https://ctan.org/tex-archive/macros/latex/contrib/beamer/doc/beameruserguide.pdf).