

# The `autobreak` package\*

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## Abstract

This package implements a simple mechanism of line/page breaking within the `align` environment of the `amsmath` package; new line characters are considered as possible candidates for the breaks and the package tries to put breaks at adequate places. It is suitable for computer-generated long formulae with many terms.

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## 1 Introduction

Sometimes people want to put long formulae in their documents, which do not fit in a line and may span over multiple pages. The following is an equation of explicitly writing down the first 50 terms in the sum of the well-known Basel problem:

$$\begin{aligned}\zeta(2) = & 1 + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} + \frac{1}{25} + \frac{1}{36} + \frac{1}{49} + \frac{1}{64} + \frac{1}{81} + \frac{1}{100} + \frac{1}{121} + \frac{1}{144} + \frac{1}{169} \\ & + \frac{1}{196} + \frac{1}{225} + \frac{1}{256} + \frac{1}{289} + \frac{1}{324} + \frac{1}{361} + \frac{1}{400} + \frac{1}{441} + \frac{1}{484} + \frac{1}{529}\end{aligned}$$

---

\*This document corresponds to `autobreak` v0.1, dated 2016/06/03.

$$\begin{aligned}
& + \frac{1}{576} + \frac{1}{625} + \frac{1}{676} + \frac{1}{729} + \frac{1}{784} + \frac{1}{841} + \frac{1}{900} + \frac{1}{961} + \frac{1}{1024} + \frac{1}{1089} \\
& + \frac{1}{1156} + \frac{1}{1225} + \frac{1}{1296} + \frac{1}{1369} + \frac{1}{1444} + \frac{1}{1521} + \frac{1}{1600} + \frac{1}{1681} + \frac{1}{1764} \\
& + \frac{1}{1849} + \frac{1}{1936} + \frac{1}{2025} + \frac{1}{2116} + \frac{1}{2209} + \frac{1}{2304} + \frac{1}{2401} + \frac{1}{2500} + \dots \quad (1)
\end{aligned}$$

The above example might seem nonsense, but putting long formulae may have a meaning in some cases and become inevitable for completeness of documents, writing self-contained papers, or just to impress readers. They are typically generated as outputs of computer algebra systems, and would have the form of a sum of many terms while each term is short.

Then, the question is how to break long formulae in such a way that the expressions do not make any overfull lines for L<sup>A</sup>T<sub>E</sub>X. Certainly, one can attempt to manually insert line breaks by trial and error, checking whether L<sup>A</sup>T<sub>E</sub>X warns overfull lines, and this process could be automatized by external scripts at some extent. A shortcoming of such ‘manual’ approaches is that line breaks have to be reexamined whenever the layout of the document is changed, e.g., replacing the document class or reusing existing equations into another document with a different format.

The goal of the `autobreak` package is to give a reasonably simple solution for (semi-)automatic line breaking of long formulae within L<sup>A</sup>T<sub>E</sub>X<sup>1</sup>.

## 2 Usage

The `autobreak` package is supposed to be used together with the `amsmath` package<sup>23</sup>:

```
\usepackage{amsmath}
\usepackage{autobreak}
```

When your document contains long equations over multiple pages, you might want to use `\allowdisplaybreaks` of `amsmath` package:

```
\allowdisplaybreaks
```

```
\begin{autobreak}
<long-equations>
\end{autobreak}
```

---

<sup>1</sup>There is another package `breqn` (<https://www.ctan.org/pkg/breqn>), which adopts a more automatic fashion and is useful for more sophisticated line breaking, unless you get “Dimension too large” error for really big expressions.

<sup>2</sup><https://www.ctan.org/pkg/amsmath>.

<sup>3</sup>Actually `autobreak` internally loads `amsmath`, but it is still a good practice to explicitly include all packages providing macros used in your document.

The `autobreak` environment is used for breaking lines in long formulae in the `align` environment of `amsmath`<sup>4</sup>.

<pre> \begin{align} \begin{autobreak} \zeta(3) = 1 + \frac{1}{8} + \frac{1}{27} + \frac{1}{64} + \frac{1}{125} + \frac{1}{216} + \frac{1}{343} + \frac{1}{512} + \frac{1}{729} + \frac{1}{1000} + \frac{1}{1331} + \frac{1}{1728} + \frac{1}{2197} + \frac{1}{2744} + \frac{1}{3375} + \frac{1}{4096} + \frac{1}{4913} + \frac{1}{5832} + \frac{1}{6859} + \frac{1}{8000} + \dots \end{autobreak} \end{align} </pre>	$ \begin{aligned} \zeta(3) = & 1 + \frac{1}{8} + \frac{1}{27} + \frac{1}{64} + \frac{1}{125} \\ & + \frac{1}{216} + \frac{1}{343} + \frac{1}{512} + \frac{1}{729} \\ & + \frac{1}{1000} + \frac{1}{1331} + \frac{1}{1728} \\ & + \frac{1}{2197} + \frac{1}{2744} + \frac{1}{3375} \\ & + \frac{1}{4096} + \frac{1}{4913} + \frac{1}{5832} \\ & + \frac{1}{6859} + \frac{1}{8000} + \dots \quad (2) \end{aligned} $
--	--

The magic happens from the simple fact that `autobreak` interprets all new line characters appearing between `\begin{autobreak}` and `\end{autobreak}` as *breakable points*, at which any line breaks can be logically inserted. To be more exact, the first non-empty block, separated from the rest by a new line character, determines the indentation of the successive lines. Then `autobreak` tries to fill the line with the rest of the blocks, and puts a line break when they do not fit in a line. This is clarified by the following example:

---

<sup>4</sup>Technically, `align` (with `\notag` to suppress equation numbers except the last line) is the only option we can use for page-break aligned equations within `amsmath` because `split`, `gathered`, `aligned` and `alignedat` do not allow page breaking. `dmath` of `breqn` with `\eqinterlinepenalty=0` allows page breaking, but may fail to find a reasonable tag place.

```

\begin{align}
\begin{autobreak}
\NumberedBox{1}
\NumberedBox{2}
\NumberedBox{3}
\NumberedBox{4}
\NumberedBox{5}
\NumberedBox{6}
\NumberedBox{7}
\NumberedBox{8}
\NumberedBox{9}
\NumberedBox{10}
\NumberedBox{11}
\end{autobreak}
\end{align}

```

$$\begin{array}{ccccc}
\boxed{1} & \boxed{2} & \boxed{3} & \boxed{4} & \boxed{5} \\
& \boxed{6} & \boxed{7} & \boxed{8} & \boxed{9} \\
& \boxed{10} & \boxed{11} & & 
\end{array} \quad (3)$$

It is also possible to put more than one `autobreak` in one `align`:

```

\begin{align}
\begin{autobreak}
\NumberedBox{1} =
\NumberedBox{2}
+ \NumberedBox{3}
+ \NumberedBox{4}
+ \NumberedBox{5}
+ \NumberedBox{6}
+ \NumberedBox{7}
+ \NumberedBox{8}
+ \NumberedBox{9}
+ \NumberedBox{10} ,
\end{autobreak}
\\
\begin{autobreak}
\LongerNumberedBox{1} =
\NumberedBox{2}
+ \NumberedBox{3}
+ \NumberedBox{4}
+ \NumberedBox{5}
+ \NumberedBox{6}
+ \NumberedBox{7}
+ \NumberedBox{8}
+ \NumberedBox{9}
+ \NumberedBox{10} .
\end{autobreak}
\end{align}

```

$$\begin{array}{lcl}
\boxed{1} = & \boxed{2} + \boxed{3} + \boxed{4} & \\
& + \boxed{5} + \boxed{6} & \\
& + \boxed{7} + \boxed{8} & \\
& + \boxed{9} + \boxed{10} , & (4) \\
\boxed{1} = & \boxed{2} + \boxed{3} + \boxed{4} & \\
& + \boxed{5} + \boxed{6} & \\
& + \boxed{7} + \boxed{8} & \\
& + \boxed{9} + \boxed{10} . & (5)
\end{array}$$

For a technical reason, it often requires more than one run of L<sup>A</sup>T<sub>E</sub>X, and in such

cases one will get informed by the following warning:

```
Package autobreak Warning: Layout may have changed.
(autobreak)                Rerun to get layout correct.
```

In the next run, the layout of the equations will be corrected.

```
\everybeforeautobreak {\tokens}
\everyafterautobreak {\tokens}
```

They specify token lists inserted before and after automatically inserted line breaks in `autobreak`. For example,

```
\begin{align}
\everyafterautobreak{\times}
\begin{autobreak}
\cos\left(\frac{\pi x}{2}\right) =
\left(1-x^2\right)
\left(1-\frac{x^2}{9}\right)
\left(1-\frac{x^2}{25}\right)
\left(1-\frac{x^2}{49}\right)
\left(1-\frac{x^2}{81}\right)
\left(1-\frac{x^2}{121}\right)
\left(1-\frac{x^2}{169}\right)
\left(1-\frac{x^2}{225}\right)
\left(1-\frac{x^2}{289}\right)
\left(1-\frac{x^2}{361}\right)
\left(1-\frac{x^2}{441}\right)
\dots
\end{autobreak}
\end{align}
```

$$\begin{aligned} \cos\left(\frac{\pi x}{2}\right) &= (1-x^2) \left(1-\frac{x^2}{9}\right) \left(1-\frac{x^2}{25}\right) \left(1-\frac{x^2}{49}\right) \left(1-\frac{x^2}{81}\right) \\ &\quad \times \left(1-\frac{x^2}{121}\right) \left(1-\frac{x^2}{169}\right) \left(1-\frac{x^2}{225}\right) \left(1-\frac{x^2}{289}\right) \\ &\quad \times \left(1-\frac{x^2}{361}\right) \left(1-\frac{x^2}{441}\right) \dots \end{aligned} \tag{6}$$

### 3 Caveats

Because `autobreak` tries to insert line breaks at any of new line characters, you must not make any new lines at which the line cannot be broken<sup>5</sup>. For example

---

<sup>5</sup>You may put "%" at the end of the line to avoid a new line.

```

\begin{align}
\begin{autobreak}
x =
% A problematic line break.
\frac{1}
{2} .
\end{autobreak}
\end{align}

```

gives an error in the typesetting:

```

! Missing } inserted.
<inserted text>
}
1.8 \end{align}

```

Putting ‘\’ or ‘&’ inside `autobreak`, which tries to insert these special stuffs automatically, also causes typesetting errors.

The `autobreak` environment uses `\linewidth` as the maximum width that expressions in its body can occupy. There is no way for `autobreak` to know how much other formulae consume the space outside it. Therefore it fails to determine the adequate maximum width when there are expressions outside `autobreak` and then L<sup>A</sup>T<sub>E</sub>X gives overfull line warnings:

```

\begin{align}
\text{some stuff outside autobreak}
\begin{autobreak}
\text{LHS} =
...
\end{autobreak} . % Even just a "." can be problematic.
\end{align}
% May give overfull line warnings

```

One may want to separate long formulae from the main document file to other files and include them via `\input{<file>}`, for example,

```

\begin{align}
\begin{autobreak}
\input{longeqn.inc} % It works!
\end{autobreak}
\end{align}

\begin{align}
\begin{autobreak}
lhs =
\input{longrhs.inc} % It also works!
.
\end{autobreak}
\end{align}

```

The current version of `autobreak` supports these cases: the file content of `\input{file}` is expanded before recognizing the lines, with the help of the `catchfile` package<sup>6</sup>, when it appears at the beginning of each line. But it does not support `\input{file}` in the middle of the lines:

```
\begin{align}
  \begin{autobreak}
    x + \input{longexpr.inc} % Sorry, it does not work.
  \end{autobreak}
\end{align}
```

The difficulty comes from the fact that it needs to be expanded before `autobreak` scans lines. By the same reason, `autobreak` fails to detect new lines defined inside macros<sup>7</sup>:

```
\newcommand{\foo}{
  a
  + b
  + c
  + d
}
\begin{align}
  \begin{autobreak}
    \foo + \foo + \foo + \foo % No new lines can be detected.
  \end{autobreak}
\end{align}
```

## 4 Implementation

```
1 \<package>
2 \NeedsTeXFormat{LaTeX2e}
3 \ProvidesPackage{autobreak}%
4 [2016/06/03 v0.1 simple line breaking of long formulae]
```

### 4.1 Registers and constants

`\everybeforeautobreak` The list of tokens that gets inserted before every line break generated by `autobreak`.

```
5 \newtoks\everybeforeautobreak
```

`\everyafterautobreak` The list of tokens that gets inserted after every line break generated by `autobreak`.

```
6 \newtoks\everyafterautobreak
```

---

<sup>6</sup><https://www.ctan.org/pkg/catchfile>.

<sup>7</sup>Actually, when the definition of `\foo` is parsed, the new line characters inside it are usually lost.

<code>\@autobreak@alltoks</code>	The token register to store the whole result of <code>autobreak</code> . 7 <code>\newtoks\@autobreak@alltoks</code>
<code>\@autobreak@linetoks</code>	The token register for the current line. 8 <code>\newtoks\@autobreak@linetoks</code>
<code>\@autobreak@lhswidth</code>	The width of the current left-hand side. 9 <code>\newdimen\@autobreak@lhswidth</code>
<code>\@autobreak@rhswidth</code>	The width of the current right-hand side. 10 <code>\newdimen\@autobreak@rhswidth</code>
<code>\@autobreak@maxlhswidth</code>	The width of the longest left-hand side occupied. Affected by the <code>.aux</code> file generated in the previous run. 11 <code>\newdimen\@autobreak@maxlhswidth</code>
<code>\@autobreak@realmaxlhswidth</code>	The width of the longest left-hand side occupied. Not affected by the <code>.aux</code> file generated in the previous run. 12 <code>\newdimen\@autobreak@realmaxlhswidth</code>
<code>\@autobreak@maxrhswidth</code>	The maximum width that the right-hand sides can occupy. 13 <code>\newdimen\@autobreak@maxrhswidth</code>
<code>\@autobreak@sep</code>	The additional space needed for putting the left-hand side and the right-hand side in one line, in other words, the separation for <code>&amp;</code> . TODO: how can we know the exact extra space to be inserted? 14 <code>\def\@autobreak@sp{7\p@}</code>
<code>\@autobreak@newlinechar</code>	The macro representing an active <code>^M</code> . 15 <code>\begingroup</code> 16 <code>\catcode'\^M=\active</code> 17 <code>\gdef\@autobreak@newlinechar{^M}</code> 18 <code>\endgroup</code>
<code>\if@autobreak@invalidlayout</code>	The switch to be turned on when an invalid layout is detected. 19 <code>\newif\if@autobreak@invalidlayout</code> 20 <code>\@autobreak@invalidlayoutfalse</code>

## 4.2 Interaction with `.aux` files

When there are two or more `autobreak` in one `align`, each `autobreak` has to know the maximum width of the left-hand side of the all `autobreak` in the same `align`. Instead of violating ‘causality’ (e.g., how `LATEX` parses a file from the beginning to the end), we use `.aux` file to store the maximum left-hand side width, which provides the correct value in the next run.



Show a warning if the user needs to rerun.

```

21 \AtEndDocument{%
22   \if@autobreak@invalidlayout
23     \if@filesw
24       \PackageWarningNoLine{autobreak}{Layout may have changed.
25         \MessageBreak Rerun to get layout correct}%
26     \else
27       \PackageWarningNoLine{autobreak}{Layout may be wrong}%
28     \fi
29   \fi
30 }

```

`\@autobreak@getmaxlhswidth` To be expanded to a value saved in `.aux` in the previous run, or `Opt` if not found.

```

31 \def\@autobreak@getmaxlhswidth#1{%
32   \ifundefined{@autobreak@w@#1}{%
33     \z@
34   }{%
35     \@nameuse{@autobreak@w@#1}%
36   }%
37 }

```

`\@autobreak@setmaxlhswidth` Called in `.aux`.

```

38 \def\@autobreak@setmaxlhswidth#1#2{%
39   \global\@namedef{@autobreak@w@#1}{#2}%
40 }

```

`@autobreak@eqnindex` The counter to identify each align.

```

41 \newcounter{@autobreak@eqnindex}

```

`@autobreak@subeqnindex` The counter to store the number of autobreak in an align.

```

42 \newcounter{@autobreak@subeqnindex}[@autobreak@eqnindex]%

```

`\@autobreak@loadmaxlhswidth` Loads `\@autobreak@maxlhswidth` for the next align.

```

43 \def\@autobreak@loadmaxlhswidth{%
44   \stepcounter{@autobreak@eqnindex}%
45   \@autobreak@maxlhswidth=%
46     \@autobreak@getmaxlhswidth{\arabic{@autobreak@eqnindex}}%
47   \@autobreak@realmaxlhswidth=\z@
48 }

```

`\@autobreak@savemaxlhswidth` Saves `\@autobreak@realmaxlhswidth` for the next run.

```

49 \def\@autobreak@savemaxlhswidth{%
50   \ifnum\arabic{@autobreak@subeqnindex}>0
51     \ifdim\@autobreak@maxlhswidth=\@autobreak@realmaxlhswidth
52     \else

```

We have used the wrong value of `\@autobreak@maxlhswidth` (was too much).  
Need to rerun.

```

53     \global\@autobreak@invalidlayouttrue
54   \fi

```

Note that `\@autobreak@maxlhswidth` becomes problematic only when two or more `autobreak` appear in one `align`. In the case with one `autobreak`, the default value `Opt` is safe for the next run.

```
55 \ifnum\arabic{@autobreak@subeqnindex}>1
56 \if@filesw
```

We should provide `\@autobreak@setmaxlhswidth` in `.aux`.

```
57 \ifundefined{@autobreak@auxinited}{%
58 \immediate\write\@mainaux{%
59 \string\providecommand
60 \string\@autobreak@setmaxlhswidth[2]}%
61 }%
62 \gdef\@autobreak@auxinited{}%
63 }{}%
64 \immediate\write\@auxout{%
65 \string\@autobreak@setmaxlhswidth%
66 {\arabic{@autobreak@eqnindex}}%
67 {\the\@autobreak@realmaxlhswidth}%
68 }%
69 \fi
70 \fi
71 \fi
72 }
```

### 4.3 Hacking amsmath

```
73 \RequirePackage{amsmath}
```

`\if@autobreak@newlinedef` The switch to be turned on when `\@autobreak@newlinedef` applies.

```
74 \newif\if@autobreak@newlinedef
75 \@autobreak@newlinedeffalse
```

`\@autobreak@newlinedef` Installs the definition of  $\sim$  as a space. This is virtually harmless in math mode.

```
76 \begingroup
77 \catcode'\sim=\active
78 \gdef\@autobreak@newlinedef{%
79 \def\sim{ }%
80 \@autobreak@newlinedeftrue
81 }
82 \endgroup
```

`\collect@body` We need to override `\collect@body` such that it keeps  $\sim$ .

```
83 \def\collect@body#1{%
84 \@envbody={\expandafter#1\expandafter{\the\@envbody}}%
85 \edef\process@envbody{%
86 \the\@envbody\noexpand\end{\@currenvir}}%
87 }%
88 \@envbody=\emptytoks
89 \def\begin@stack{b}%
90 \begingroup
```

Actually, the following three lines need to be inserted to the original code.

```

91 \if@autobreak@newlinedef
92 \catcode'\^M=\active
93 \fi
94 \expandafter\let\csname\@currentenv\endcsname=\collect@body
95 \edef\process@envbody{%
96 \expandafter\noexpand\csname\@currentenv\endcsname
97 }%
98 \process@envbody
99 }

```

**align** Hack align of amsmath.

```

100 \let\@autobreak@oldstart@align=\start@align
101 \def\start@align{%
102 \@autobreak@loadmaxlhwidth
103 \@autobreak@newlinedef
104 \@autobreak@oldstart@align
105 }

106 \let\@autobreak@oldendalign=\endalign
107 \def\endalign{%
108 \@autobreak@savemaxlhwidth
109 \@autobreak@oldendalign
110 }

```

#### 4.4 autobreak environment

**autobreak** Checks if we are in align (and \@autobreak@newlinedef is applied), increments the counter and collects its body via \collect@body.

```

111 \newenvironment{autobreak}{%
112 \if@autobreak@newlinedef
113 \else
114 \PackageError{autobreak}{%
115 autobreak is not allowed here
116 }{%
117 Use autobreak inside align.
118 }%
119 \fi
120 \stepcounter{@autobreak@subeqnindex}%
121 \collect@body\@autobreak
122 }{}

```

**\@autobreak** Called from \collect@body. The parameter #1 is the whole body. It takes also #2 and #3, which are always \end and autobreak, to remove them from the successive tokens.

```

123 \def\@autobreak#1#2#3{%
First, close the group of autobreak.
124 \end{autobreak}%

```

Then parse the given body of the environment and construct lines to be passed to `align`.

```

125 \@autobreak@init
126 \def\@tempa{\expandafter\@autobreak@scanline
127   \@autobreak@newlinechar#1}%
128 \expandafter\@tempa\@autobreak@newlinechar\@autobreak@end
129 }

```

`\@autobreak@init` Initialization.

```

130 \def\@autobreak@init{%
131   \@autobreak@alltoks={}%
132   \@autobreak@linetoks={}%
133   \@autobreak@lhswidth=\z@
134 }

```

`\@autobreak@end` Finalization. It generates the whole lines in one go.

```

135 \def\@autobreak@end{%
136   \expandafter\@autobreak@addtoks\expandafter\@autobreak@alltoks
137   \expandafter{\the\@autobreak@linetoks}%
138   \the\@autobreak@alltoks
139 }

```

`\@autobreak@scanline` Takes a line from the input stream. Here a line ends with `^^M`.

```

140 \begingroup
141   \catcode'\^^M=\active
142   \gdef\@autobreak@scanline#1^^M{\@autobreak@scanline@{#1}}
143 \endgroup

```

If the next token is a punctuation, then we merge it into the current line. (Otherwise it can make a line only with a period, for example).

```

144 \def\@autobreak@scanline@#1{%
145   \@autobreak@ifnextpunct{%
146     \@autobreak@scanline@gobble{#1}%
147   }{%
148     \@autobreak@scanline@@{#1}%
149   }%
150 }

```

A helper macro of `\@ifnextpunct{<if-yes>}{<if-no>}`.

```

151 \def\@autobreak@ifnextpunct#1#2{%
152   \@ifnextchar.{%
153     #1%
154   }{%
155     \@ifnextchar,{%
156       #1%
157     }{%
158       \@ifnextchar;%%
159       #1%
160     }{%
161       \@ifnextchar:{%

```

```

162         #1%
163     }{%
164         #2%
165     }%
166 }%
167 }%
168 }%
169 }

```

Merge punctuations as possible (usually there is only one period in a line, though).

```

170 \def\@autobreak@scanline@gobble#1#2{%
171     \@autobreak@ifnextpunct{%
172         \@autobreak@scanline@gobble{#1#2}%
173     }{%
174         \@autobreak@scanline@@{#1#2}%
175     }%
176 }

```

Pass the current line to \@autobreak@processline. Then, repeat scanning lines until \@autobreak@end appears as the next token.

```

177 \def\@autobreak@scanline@@#1{%
178     \@autobreak@processline{#1}%
179     \@ifnextchar\@autobreak@end{}{%
180         \@autobreak@scanline@@@
181     }%
182 }

```

One may expect \input{<file>} in autobreak is expanded by the file content and autobreak treats new lines in it correctly. But it needs more work. Because handling of \input in the middle of the lines is rather involved, for now we support only \input at the beginning of each line (which is what sane people usually do). This can be done via the catchfile package.

```

183 \IfFileExists{catchfile.sty}{
184     \RequirePackage{catchfile}
185     \def\@autobreak@scanline@@@{%
186         \@ifnextchar\input{%
187             \@autobreak@scanline@input
188         }{%
189             \@autobreak@scanline
190         }%
191     }
192 }{
193     \def\@autobreak@scanline@@@{%
194         \@ifnextchar\input{%
195             \PackageWarning{autobreak}{%
196                 Cannot handle new lines in a file via \protect\input,
197                 \MessageBreak which requires the catchfile package
198             }%
199         }%
200         \@autobreak@scanline
201     }

```

202 }

The argument #1 is \input and #2 is the file name.

```
203 \def\@autobreak@scanline@input#1#2{%
204   \CatchFileDef\@tempa{#2}{\catcode'\^M=\active}%
205   \expandafter\@autobreak@scanline\@tempa
206 }
```

\@autobreak@processline Each line from \@autobreak@scanline should be regarded as a ‘block’ in the equation. The first block (typically the left-hand side + ‘=’) determines the indentation for the successive lines. From the second block, try to append the block to the end of the line and insert a line break if it does not fit in a line.

```
207 \def\@autobreak@processline#1{%
208   \ifdim\@autobreak@lhswidth=\z@
```

For the first block. The rest of the width for the right-hand sides is determined from \linewidth and \@autobreak@maxlhswidth.

```
209   \@autobreak@settowidth\@autobreak@lhswidth{#1}%
210   \ifdim\@autobreak@lhswidth>\z@
211     \ifdim\@autobreak@lhswidth>\@autobreak@maxlhswidth
212       \ifdim\@autobreak@maxlhswidth>\z@
```

The previous one used the wrong value of \@autobreak@maxlhswidth (was too short). Need to rerun.

```
213       \global\@autobreak@invalidlayouttrue
214       \fi
215       \global\@autobreak@maxlhswidth=\@autobreak@lhswidth
216     \fi
217     \ifdim\@autobreak@lhswidth>\@autobreak@realmaxlhswidth
218       \global\@autobreak@realmaxlhswidth=\@autobreak@lhswidth
219     \fi
220     \@autobreak@maxrhswidth=\linewidth
221     \advance\@autobreak@maxrhswidth by -\@autobreak@maxlhswidth
222     \advance\@autobreak@maxrhswidth by -\@autobreak@sp
223     \@autobreak@alltoks={#1{}}&}%
224   \fi
225   \else
```

For the rest of the blocks.

```
226   \@autobreak@settowidth\@autobreak@rhswidth
227   {\the\@autobreak@linetoks#1\the\everybeforeautobreak}%
228   \ifdim\@autobreak@rhswidth>\@autobreak@maxrhswidth
```

Adding the next block gives an overfull line. Need a line break.

```
229   \edef\@tempa{\the\@autobreak@linetoks\the\everybeforeautobreak}%
230   \expandafter\@autobreak@addtoks\expandafter\@autobreak@alltoks
231   \expandafter{\@tempa\notag\\&}%
232   \@autobreak@linetoks=\everyafterautobreak
233   \fi
234   \@autobreak@addtoks\@autobreak@linetoks{#1}%
235   \fi
236 }
```

```

\@autobreak@addtoks Appends #2 to the token register #1.
237 \def\@autobreak@addtoks#1#2{%
238   #1=\expandafter{\the#1#2}%
239 }

\@autobreak@settowidth Same as \settowidth but in math mode. We assume \displaystyle. (Anyway
align issues \displaystyle at the beginning of every cell.)
240 \def\@autobreak@settowidth#1#2{%
241   \settowidth#1{$\displaystyle#2$}%
242 }

243 \</package>

```

## Change History

v0.1  
 General: Initial version . . . . . 1

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