

UPDATE OF LATEX.LIB REPLACING AND TYPESETTING OF MULTIINDICES

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1. INTRODUCTION

The SINGULAR library `latex.lib` provides typesetting of the Singular datatype. In particular indexed variables in the form `x1`, `x_1` or `x(1)` will be set by calling `texpoly("",_)` as `x_{1}` which result in x_1 . Singular allows multi-indexed variables in the form `x(1)(2)` or `y(2)(3)(4)` where even negative indices are allowed. With this update of `latex.lib` also these are set accordingly as `x_{1,2}` resp. `y_{2,3,4}` which results in $x_{1,2}$ and $y_{2,3,4}$. Furthermore `latex.lib` already provided a mechanism for replacing the variable names. This feature is especially useful in the non-commutative case PLURAL where variables represent differential operator. Setting the list `TeXreplace` accordingly, a variable `x` can be T_EX-ed as ∂_x . Since this seems not be widely known, some examples are shown here.

2. MULTIINDICES

1.

```
> ring r7=0, (x(1..2)(1..3)), dp;          texring("", basering, "C");
```

$$\mathbb{C}[x_{1,1}, x_{1,2}, x_{1,3}, x_{2,1}, x_{2,2}, x_{2,3}]$$

```
> matrix M[2][3] = maxideal(1);          print(M); texobj("", M);
```

$$\begin{array}{l} x(1)(1), x(1)(2), x(1)(3), \\ x(2)(1), x(2)(2), x(2)(3) \\ \longrightarrow \begin{pmatrix} x_{1,1} & x_{1,2} & x_{1,3} \\ x_{2,1} & x_{2,2} & x_{2,3} \end{pmatrix} \end{array}$$

2.

```
> ring r5=0, (x(1..2)(1..2)), dp;          texring("", basering);
```

$$\mathbb{Q}[x_{1,1}, x_{1,2}, x_{2,1}, x_{2,2}]$$

$$(x(1)(1), x(1)(2), x(2)(1), x(2)(2)) \longrightarrow (x_{1,1} \ x_{1,2} \ x_{2,1} \ x_{2,2})$$

3.

```
ring r6=0, (x(1..2), y1, z), dp;          texring("", basering);
```

$$\mathbb{Q}[x_1, x_2, y_1, z]$$

$$x(1), x(2), y_1, z \longrightarrow (x_1 \ x_2 \ y_1 \ z)$$

3. REPLACEMENT

(1)

```
> list TeXreplace;
> TeXreplace[1] = list("X", "\\partial_x");
> TeXreplace[2] = list("Y", "\\partial_y");
```

```
> ring t = 0, (X, x, y, Y), dp;   texring("", basering);

$$\mathbb{Q}[\partial_x, x, y, \partial_y]$$

```