Ok_dmodule (Okutani D-module)

Edition : auto generated by oxgentexi on 28 April 2024

OpenXM.org

1 D-module (library by Okutani)

gr, xm, ok_matrix.rr, ok_diff.rr, ok_diff.rr .

OpenXM/Risa/Asir ,

```
load("ok_diff.rr")$ load("ok_dmodule.rr")$
```

.

Yukio Okutani D- sm1 . odmodule_ .

1.0.1 odmodule_d_op_tosm1

odmodule_d_op_tosm1(*LL*,*V*)
:: sm1 .

return

LL

V

- .
- odiff_op_tosm1.
- odmodule_d_op_tosm1

```
[299] odmodule_d_op_tosm1([[[x,[2,0]],[-1,[0,0]]],
                           [[y,[0,2]],[-1,[0,0]]]],[x,y]);
[ + ( + (1) x) dx^2 + ( + (-1)), + ( + (1) y) dy^2 + ( + (-1))]

[300] odmodule_d_op_tosm1([[[x,[1,0]],[y,[0,1]],[1,[0,0]]],
                           [[1,[2,0]],[1,[0,2]]]],[x,y]);
[ + ( + (1) x) dx + ( + (1) y) dy + ( + (1)), + ( + (1)) dx^2 + ( + (1)) dy^2]

[301] odmodule_d_op_tosm1([[[1/2,[1,0]],[1,[0,0]]],
                           [[1/3,[0,1]],[1/4,[0,0]]]],[x,y]);
[ + ( + (6)) dx + ( + (12)), + ( + (4)) dy + ( + (3))]

[302] odmodule_d_op_tosm1([[[1/2*x,[1,0]],[1,[0,0]]],
                           [[1/3*y,[0,1]],[1/4,[0,0]]]],[x,y]);
[ + ( + (6) x) dx + ( + (12)), + ( + (4) y) dy + ( + (3))]
```

1.0.2 odmodule_d_op_toasir

odmodule_d_op_toasir(*LL*,*V*)
:: *LL* asir .

return

LL

V

- odiff_op_toasir.
- odmodule_d_op_toasir

```
[303] odmodule_d_op_toasir([[[1/2*x,[1,0]],[1,[0,0]]],
                            [[1/3*y,[0,1]],[1/4,[0,0]]]],[x,y]);
[1/2*x*dx+1,1/3*y*dy+1/4]

[304] odmodule_d_op_toasir([[[x,[1,0]],[y,[0,1]],[1,[0,0]]],
                            [[1,[2,0]],[1,[0,2]]]],[x,y]);
[x*dx+y*dy+1,dx^2+dy^2]
```

1.0.3 odmodule_d_op_fromasir

`odmodule_d_op_fromasir(`*D_list*`,`*V*`)`
:: `asir` .

return

D_list

V

- `odiff_op_fromasir`.
- `odmodule_d_op_fromasir`

```
[305] odmodule_d_op_fromasir([1/2*x*dx+1,1/3*y*dy+1/4],[x,y]);
[[[1/2*x,[1,0]],[1,[0,0]]],[[1/3*y,[0,1]],[1/4,[0,0]]]]

[306] odmodule_d_op_fromasir([x*dx+y*dy+1,dx^2+dy^2],[x,y]);
[[[x,[1,0]],[y,[0,1]],[1,[0,0]]],[[1,[2,0]],[1,[0,2]]]]
```

1.0.4 odmodule_ch_ideal

`odmodule_ch_ideal(`*D_ideal*`,`*V*`)`
:: *D_ideal*characteristic ideal.

return

D_ideal

V

- *D_ideal*generic parameter.
- `odmodule_ch_ideal`

```
[344] odmodule_ch_ideal([x*dx+y*dy+a,dx^2+dy^2],[x,y]);
[x*dx+y*dy,dx^2+dy^2,y*dy*dx-x*dy^2,(x^2+y^2)*dy^2]

[348] odmodule_ch_ideal(odiff_op_appell4(a,b,c1,c2,[x,y]),[x,y]);
[-x*dx^2+y*dy^2,2*y*x*dy*dx+(y*x+y^2-y)*dy^2,
 (2*y^2-2*y)*dy^2*dx+(-y*x+3*y^2+y)*dy^3,
 2*y*x*dy^2*dx+(y*x^2+(-2*y^2-y)*x+y^3-y^2)*dy^3]
```

1.0.5 odmodule_singular_locus

`odmodule_singular_locus(`*D_ideal*`,`*V*`)`
:: *D_ideal*singular locus.

return

D_ideal

V

- *D_ideal*generic parameter.
- `odmodule_singular_locus`

```
[356] D = odiff_op_appell4(a,b,c1,c2,[x,y])$
[357] odmodule_singular_locus(D,[x,y]);
[-y*x^3+(2*y^2+2*y)*x^2+(-y^3+2*y^2-y)*x]

[358] D = odiff_op_hg1(a,b,c,[x])$
[359] odmodule_singular_locus(D,[x]);
[x^2-x]
```

1.0.6 odmodule_restriction

`odmodule_restriction(`*D_ideal*`,`*V*`,`*Rest*`)`
:: *D_ideal* 0 restriction.

return

D_ideal

V

Rest

- *D_ideal*generic parameter.
- `odmodule_restriction`.

```
[345] odmodule_restriction([x*dx+y*dy+a,dx^2+dy^2],[x,y],[y]);
[[2,[-x*dx-a,-e0*x*dx-e0*a-e0]]]
```

1.0.7 odmodule_elimination

`odmodule_elimination(`*D_ideal*`,`*V*`,`*Elim*`)`
:: *D_ideal*elimination ideal.

return

D_ideal

V

Elim

- *D_ideal*generic parameter.
- `odmodule_elimination`.

```
[346] odmodule_elimination([x*dx+y*dy+a,dx^2+dy^2],[x,y],[[y],[0]]);
[x^2*dx^2+(2*a+2)*x*dx+a^2+a]

[347] odmodule_elimination([x*dx+y*dy+a,dx^2+dy^2],[x,y],[[y],[b]]);
[(x^2+b^2)*dx^2+(2*a+2)*x*dx+a^2+a]
```

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