

pfpcoh (cohomology/homology groups for $\mathfrak{p} \in \mathfrak{F}(\mathfrak{q})$)

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1 ${}_pF_q$ ()

${}_pF_q ({}_pF_q) ()$.

OpenXM/Risa/Asir ,

load("pfpcoh.rr")\$ load("pfphom.rr")\$

1.0.1 pfp_omega

pfp_omega(P)

: It returns the Gauss-Manin connection Omega for the generalized hypergeometric function ${}_pF_{p-1}(aa_1, aa_2, \dots; cc_1, cc_2, \dots; x)$.

Description:

Define a vector valued function Y of which elements are generalized hypergeometric function $f_1=F$ and $f_2=xd f_1/dx$, $f_3=xd f_2/dx$, ... It satisfies $dY/dx=Omega Y$. Generalized hypergeometric function is defined by the series ${}_pF_{p-1}(aa_1, aa_2, \dots; cc_1, cc_2, \dots; x) = \sum_{k=0, \infty} (aa_1)_k (aa_2)_k \dots / ((cc_1)_k (cc_2)_k \dots) x^k$

Example:

pfp_omega(3);

1.0.2 pfpcoh_intersection

pfpcoh_intersection(P)

: pfpcoh_intersection(P) returns an intersection matrix for cocycles associated to the generalized hypergeometric function ${}_pF_{p-1}$.

Description:

This program pfpcoh.rr computes an intersection matrix S of cocycles of ${}_pF_{p-1}$ and compares it with the matrix obtained by solving a differential equation for intersection matrix.

Algorithm:

Ohara, Sugiki, Takayama, Quadratic Relations for Generalized Hypergeometric Functions ${}_pF_{p-1}$

Example:

load("pfpcoh.rr")\$
S=pfpcoh_intersection(3);

Author : K.Ohara

1.0.3 pfphom_intersection

pfphom_intersection(P)

: intersection matrix of homology cycles.

Description:

Computing intersection matrix of cycles associated to $pF_{-(p-1)}$. As to the meaning of parameters c_1, c_2, c_3, \dots , see the paper Ohara, Kyushu J. Math. Vol. 51 PP.123.

Algorithm:

Ohara, Sugiki, Takayama, Quadratic Relations for Generalized Hypergeometric Functions pF_{p-1}

Example:

```
SS = pfphom_intersection(3)$
```

You get the intersection matrix of homologies for $3F_2$.

Author : K.Ohara

1.0.4 pfphom_monodromy_pair_kyushu

```
pfphom_monodromy_pair_kyushu(P)
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```
:
```

Description:

It returns the pair of monodromy matrices.

Algorithm:

Ohara, Kyushu J. Math. Vol.51 PP.123 (1997)

Example:

```
MP = pfphom_monodromy_pair_kyushu(3)$
```

You get a pair of monodromy matrices for $3F_2$ standing for two paths encircling 0 and 1.

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