

CoCoA-5 - Bug #1593

CanonicalHom

07 May 2021 08:20 - Julian Danner

Status:	New	Start date:	07 May 2021
Priority:	Normal	Due date:	
Assignee:		% Done:	0%
Category:		Estimated time:	0.00 hour
Target version:		Spent time:	0.00 hour

Description

Hi,

I was just playing around with the function PolyAlgebraHom and noticed that there is a weird behavior when working with an affine algebra over an extension field. In particular I constructed the following algebra:

```
use QQi_:=QQ[i];
Qi := QQi_/ideal(i^2+1);

use P:=Qi[x];
I:=ideal(x^2+x+1);
A:=P/I;

Kt := NewPolyRing(Qi, "t");
```

Now I want the hom $\phi: K[t] \rightarrow A$ given by $\phi(t)=x+1$. The straightforward implementation

```
phi:=PolyAlgebraHom(Kt, A, "x");
```

however gives an error (Unable to construct canonical homomorphism.).

(Might it be fixed by just replacing some call to CanonicalHom with ChainCanonicalHom?

In general I do not quite see as to why there even is the function CanonicalHom, since ChainCanonicalHom can do the same, but kind of better.)

Anyway, as a workaround, one can construct phi as follows:

```
eps := QuotientingHom(A);
phi_:= PolyAlgebraHom(Kt, P, "x");
phi := eps(phi_);
```

But it would be a lot better if the 'obvious' implementation would just work as expected. (In particular it does for the 'standard' fields QQ and ZZ/(p).)