HydroBase

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Sep 22 2009
Goals

- Ease ability to compare data of different codes
- Improve interoperability between codes
Example: ADMBase

- **Common variable definitions**
  - metric
  - curvature
  - lapse, shift, dtlapse, dtshift

- **Common parameters**
  - initial_data
  - initial_lapse
  - initial_
  - evolution_method
  - ....evolution_method
  - metric_type

- **Common scheduling groups**
  - ADMBase_InitialData
  - ADMBase_PostInitial
  - Initialize Variables
Common variable definitions
- rho
- press
- eps
- vel[3]

Common parameters
- evolution_method
- propagation_type
- timelevels

Common scheduling groups
- HydroBase_Initial
- HydroBase_RHS
- HydroBase_Select_Boundaries
- HydroBase_Con2Prim
- HydroBase_Prim2ConInitial
Example: HydroBase and Whisky

Current state:

```
whisky_tovsolverc
whisky
whisky_init_data
```

\[\text{whisky} \rightarrow \text{hydrobase}\]
interface.ccl:

# Interface definition for thorn Whisky
implements: Whisky
inherits: ..., ADMBase, Tmunubase, HydroBase

CCTK_REAL dens type=GF Timelevels=3
tag='ProlongationParameter="HydroBase::prolongation_type"'
param.ccl:

shares: HydroBase
USES CCTK_INT timelevels
USES KEYWORD prolongation_type
EXTENDS KEYWORD evolution_method ""
{
    "whisky" :: "Use Whisky to evolve the hydro variables"
}
schedule.ccl:

```c
schedule Whisky_SetupDescriptors
    AT CCTK_Initial BEFORE HydroBase_Initial
{
    LANG: C
}
"Get and store the mask descriptors"
```

```fortran
schedule Conservative2PrimitivePolytype
    IN HydroBase_Con2Prim AS Con2Prim
{
    LANG: Fortran
}
"Convert back to primitive variables (polytype)"
```
schedule.ccl:

```
schedule Whisky_Boundaries IN HydroBase_Select_Boundaries
{
    LANG: Fortran
    OPTIONS: LEVEL
    SYNC: ...
}
"Do the boundary conditions"
```
Future

- Advertise usage of HydroBase
- Include additional variables
  - composition
  - MHD
  - radiation