

WNmodel - Water Network Model Class

WNmodel class is a child of large scale model LSmodel used for modeling of water (distribution) networks.

Methods:

```
WNmodel      - constructor creating empty model or importing model from
                definition file
import_scheme - imports water network model from file
plot          - overloaded plot function

eps          - overloaded epsilon decomposition for water networks
```

Contents

- WNmodel Constructor
 - Import water network scheme description from file.
 - Display Object
 - Epsilon Decomposition
 - Compute Tanks Incidence Matrix
-

WNmodel Constructor

WNMODEL(FILENAME) constructs empty water network model or imports model from given definition file (see IMPORT_SCHEME for description of file formats).

Import water network scheme description from file.

NOBJ = IMPORT_SCHEME(OBJ,FILENAME) import water network scheme from files. Water network is defined by two files [filename].net and [filename].mat, where '.net' defines network structure and '.mat' defines variables limits, prices, etc.

Structure definition file is a simple text file describing individual tanks and their interconnections by specifying signal names and directions.

The first line of each tank definition block specifies tank number and its name:

```
Tank##,<tank name>
```

or it can specify node with its number

Node##

Following lines are same for tanks and nodes:

```
d,<demand name>
s,<source name>
+,<outlet pump/valve name>,<destination tank name>
-,<inlet pump/valve name>,<source tank name>
```

Tank/node definition blocks can be separated by empty line(s). Empty lines and Matlab type comments are ignored.

Variable definition file is standard Matlab MAT file with struct for every signal defining limits by fields

```
.min ... min value
.max ... max value
.dmin ... min slope value
.dmax ... max slope value
.smin ... soft limit min value
.smax ... soft limit max value
.type ... signal type ('MV','MD','UD','MO','MV','X')
```

Example (part of definition file):

```
Tank01,d450BEG
d,c450BEG
-,iBegues4,d369BEG

Tank02,d369BEG
d,c369BEG
+,iBegues4,d450BEG
-,iBegues3,d255BEG

Node1
s,AportA
d,c82PAL
+,vPalleja70,Node2
+,vPapiolATLL,d110PAP
+,iPapiol2AGBAR,d110PAP
+,vFontSanta,d54REL

Node2
d,c70PAL
+,iPalleja4,d125PAL
-,vPalleja70,Node1

<End of example>
```

Display Object

DISPLAY shows basic information about water network model.

Epsilon Decomposition

$\text{EPS}(\text{OBJ}, \text{N_TARGET})$ finds \epsilon decomposition of water network model after leafs condensation. Decomposes the network to N_TARGET subnetworks.

Compute Tanks Incidence Matrix

Incidence matrix I determines if there is direct connection between tanks i and j by "1" on position (i,j) .