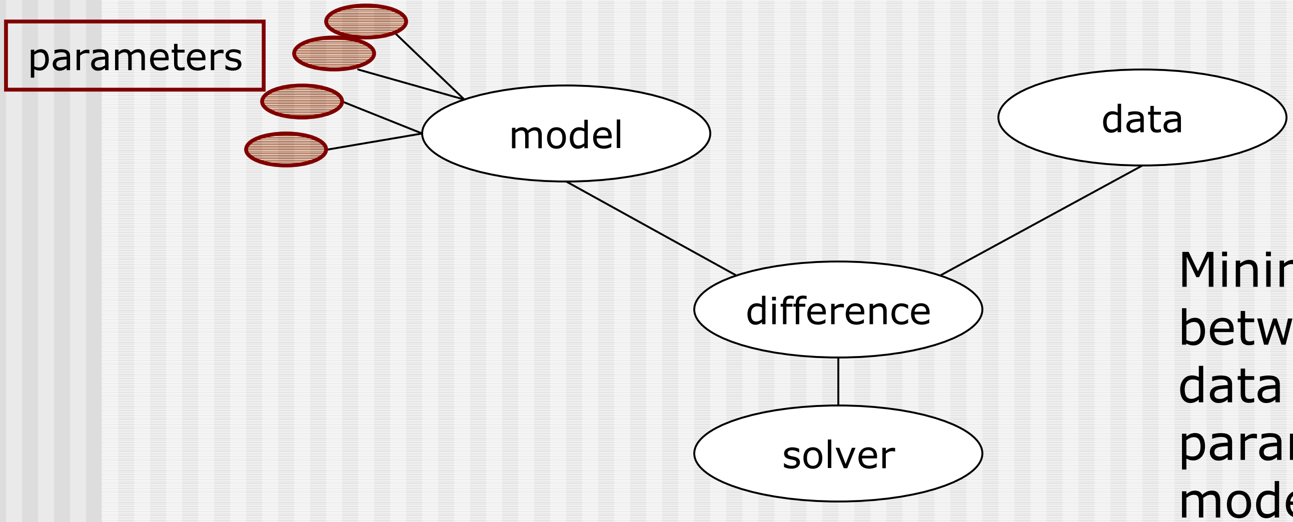
Solving

- MeqTree is a powerful tool for simulation
  - Whatever effect you can simulate, you can solve for

Basic Model of a Solve Tree:



Minimize the difference between model and data by adjusting the parameters of the model

Solving in MeqTree

- model & data : any tree

  Note: In MeqTree there is no difference between model and data, solvable parameters can show up at any side

- (Solvable) Parameters: Leaf Nodes
  - MeqParm: returns result + perturbed values
  - can be functions of Freq/Time/.. (more later)
- difference :
  - MeqCondeq :returns difference + derivatives
- Solver:
  - MeqSolver: Aips++ LM solver: adjusts parameters in several iterations
  - Needs a list of Solvable Parameters (by name)

MXM_demo_solve.py

MeqParm

- MeqParm represents a function on a given domain (Funklet)

  First input parameter of MeqParm gives the funklet with initial coefficients

  e.g. Meq.Parm(3.) : funklet is constant, initialized with 3.

- Coefficients of the function are the actual solvable parameters

  Default Funklet: polc: n x m polynomial in Freq/Time defined by shape of matrix

  e.g.: $[[c_{00},c_{01},c_{02}][c_{10},c_{11},c_{12}]]$:

  $f(\nu,t)$: $c_{00} + c_{01}\cdot t + c_{10}\cdot\nu + c_{02}\cdot t^2 + \ldots$

  Adjust MXM_demo_parm1.py:

  data is 2*time + freq

  fit 2 x 2 polc

  What happens if you fit a 2 x 3 polc? Inspect Solver result

  hint: you can force the shape of the polc by setting the **shape** field of the MeqParm

ParmTables

- In real life, you want to use your solved parameters:
  - Correct the data (see Oleg’s 3c343 script)
  - Store for later use -> parmtables (Aips++ table)
- **table_name** : specifies the table, creates new table if not existing
- Solver options for saving solutions:
    - **save_funklets =True;**
    - **last_update = True;**
- for each MeqParm several entries:
  - funklets defined on a specific domain
  - if a table is specified, MeqParm will always try to initialize with best fitting (on request domain) funklet(s)
  - lookup on ParmName + domain