

Key message:

Successor generation can be done efficiently with database techniques in lifted planning!

LIFTED PLANNING

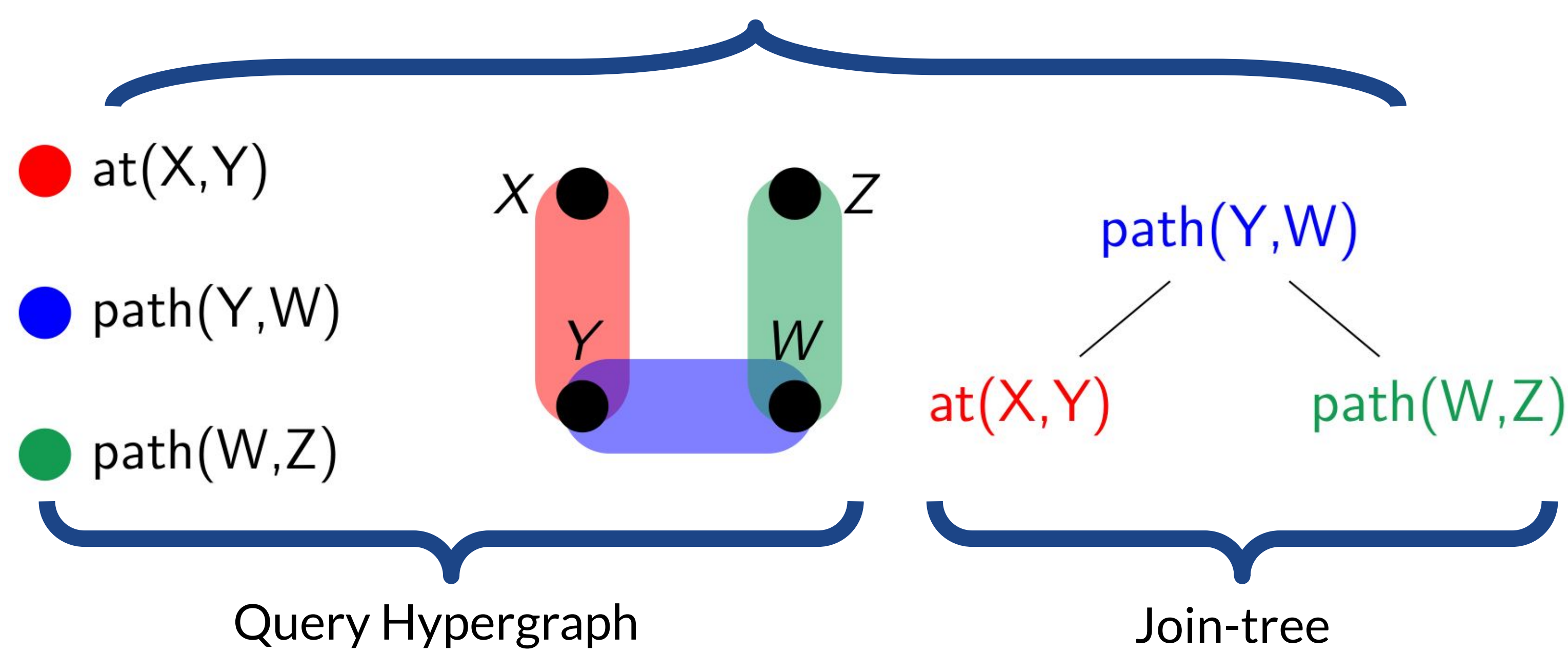
- Ground states + action schemas
- States can be seen as **databases**
- Conjunctive preconditions = **conjunctive queries**
- Performed efficiently if hypergraph is **acyclic**
- Happens in 90% of the IPC action schemas tested

EXAMPLE

```
(:preconditions  
(and (at ?X ?Y)  
      (path ?Y ?W)  
      (path ?W ?Z)))
```

Corresponds to

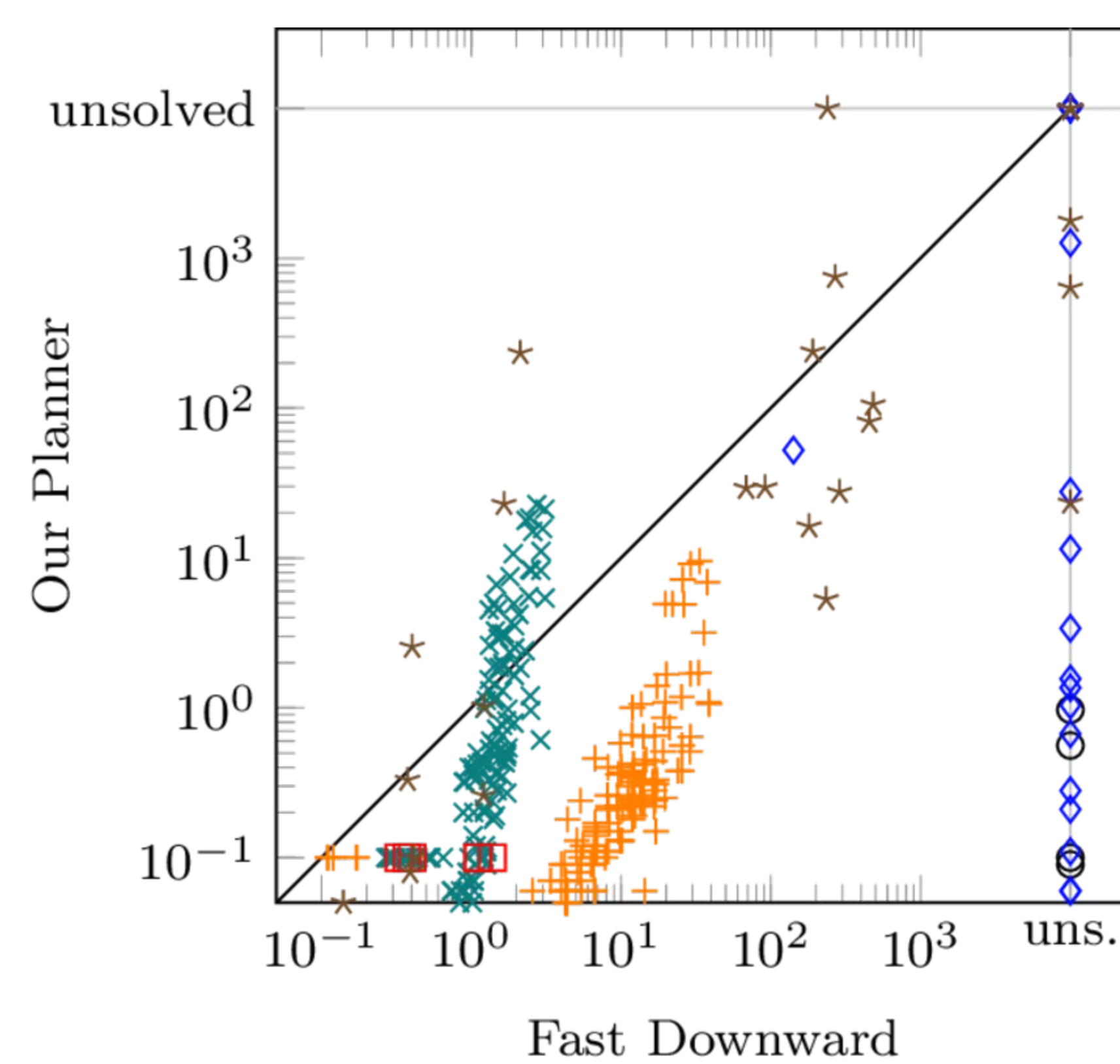
$at(X,Y) \bowtie path(Y,W) \bowtie path(W,Z)$



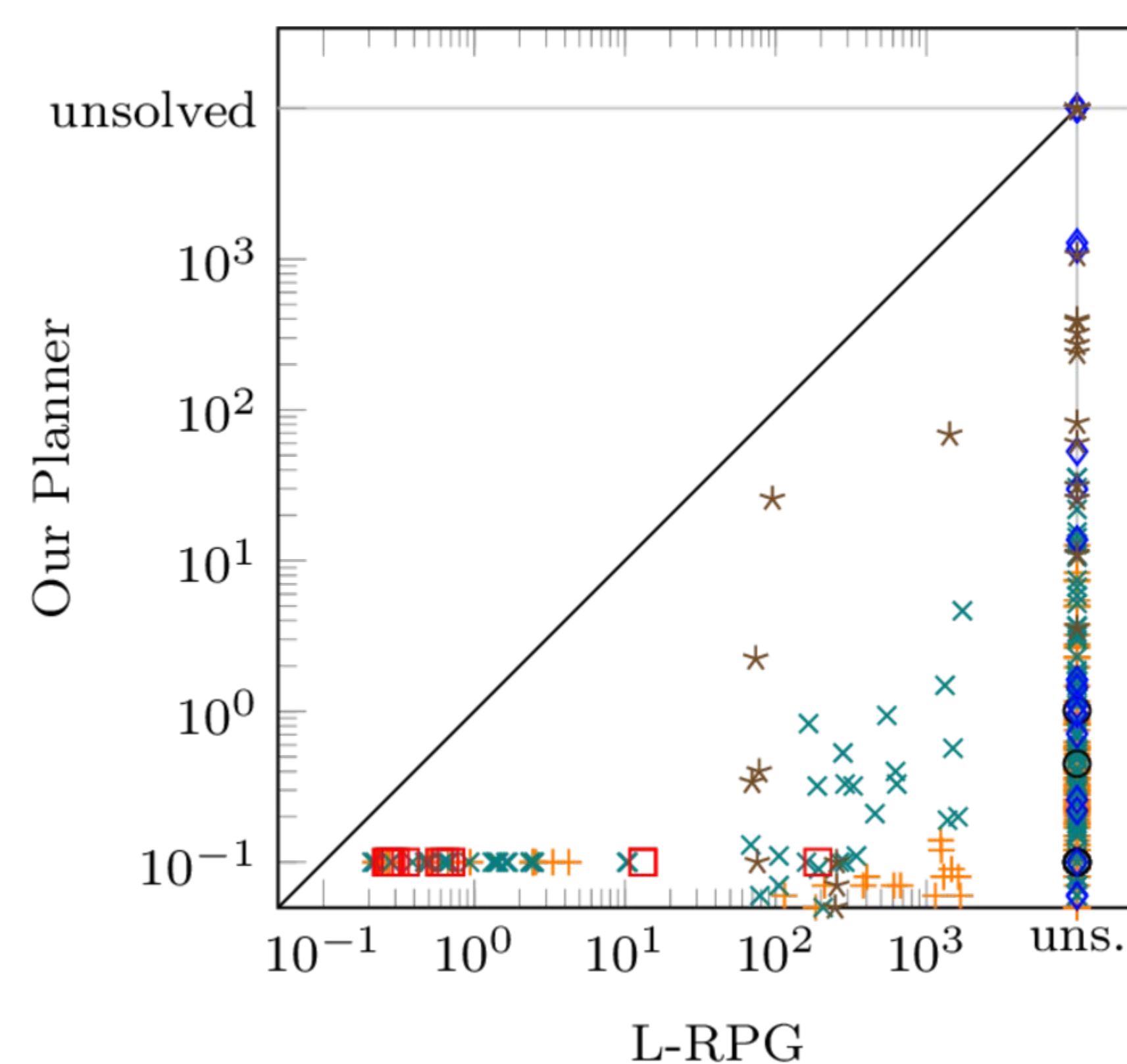
If query hypergraph has a join-tree, it is acyclic
Acyclic query evaluation is **output-polynomial**

RESULTS

Time comparison in **hard-to-ground domains**:



Better than grounding
in most of the
tested instances



Faster than previous
state-of-the-art
lifted planner

Planner	Coverage (418)
L-RPG	137
Fast Downward	352
Our Planner	384

Higher number of
solved instances

