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UML-B State-machine Animation

Rodin User and Developer Workshop 2010, Düsseldorf

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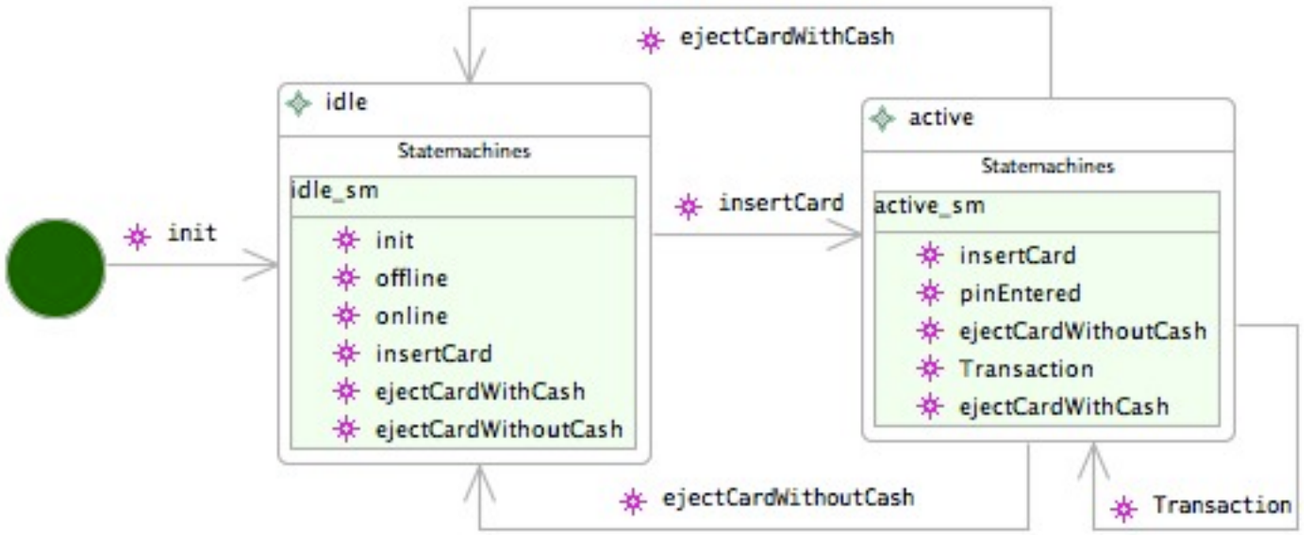
UML-B Modelling Environment

UML-B:



Event-B:

```
EVENTS
 INITIALISATION   ≙
 STATUS
  ordinary
 BEGIN
  C.init   :   C = ∅
  atm_sm.init   :   atm_sm = ∅
  idle_sm.init   :   idle_sm = ∅
  active_sm.init   :   active_sm = ∅
 END

 insertCard   ≙
 STATUS
  ordinary
 REFINES
  insertCard
 ANY
  self      //   contextual instance of class C
 WHERE
  self.type   :   self ∈ C
  idle_sm_isin_available_wd   :   self∈ dom(idle_sm)
  idle_sm_isin_available   :   idle_sm(self) = available
 THEN
```

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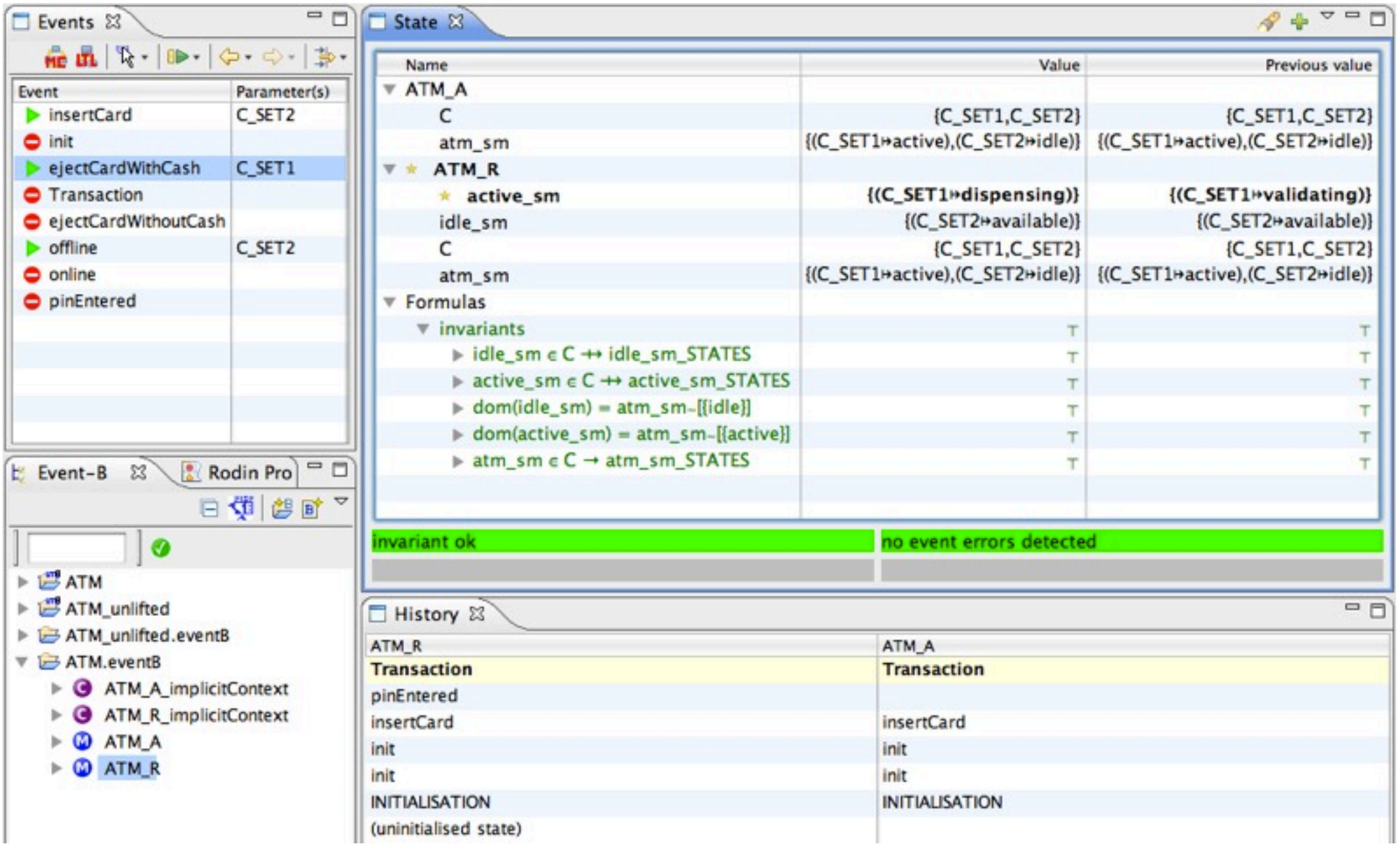
ProB Animator and Model Checker



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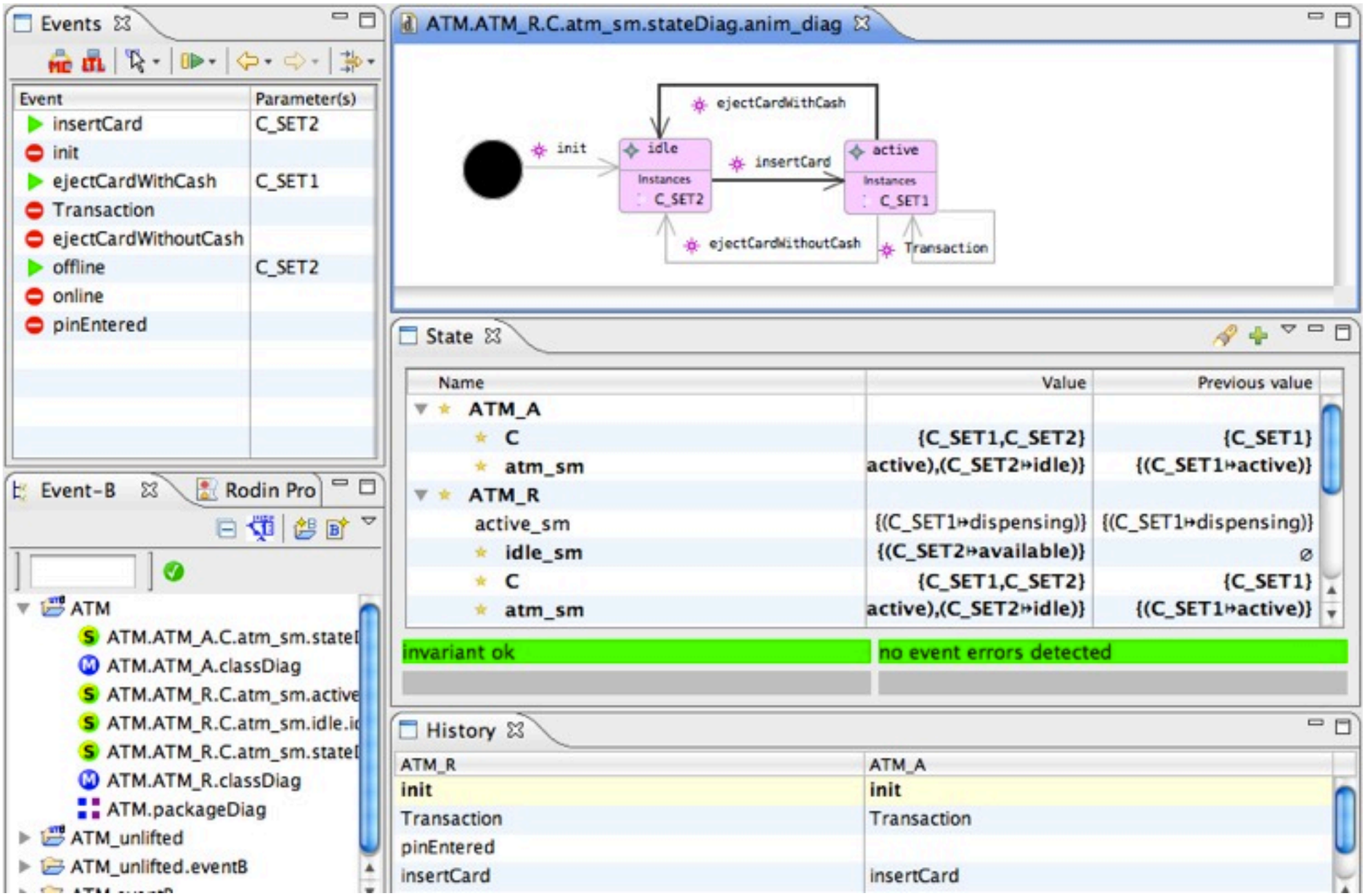
Power of Two: UML-B and ProB



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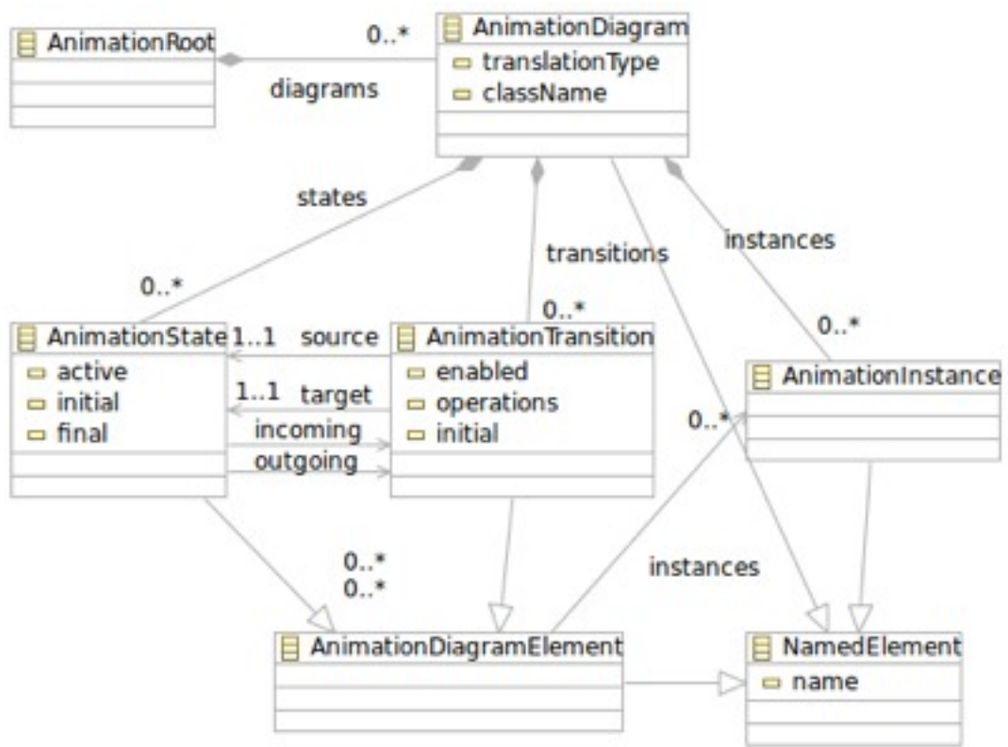
Implementation

- Animation Metamodel (EMF)
- Customised Graphical Metamodel (GMF)
- org.eclipse.ui extension
- de.prob.core.animation: <listener> extension

dependencies:

- UML-B Metamodel
- org.rodinp.core API
- de.prob.core API
- de.prob.ui.perspective



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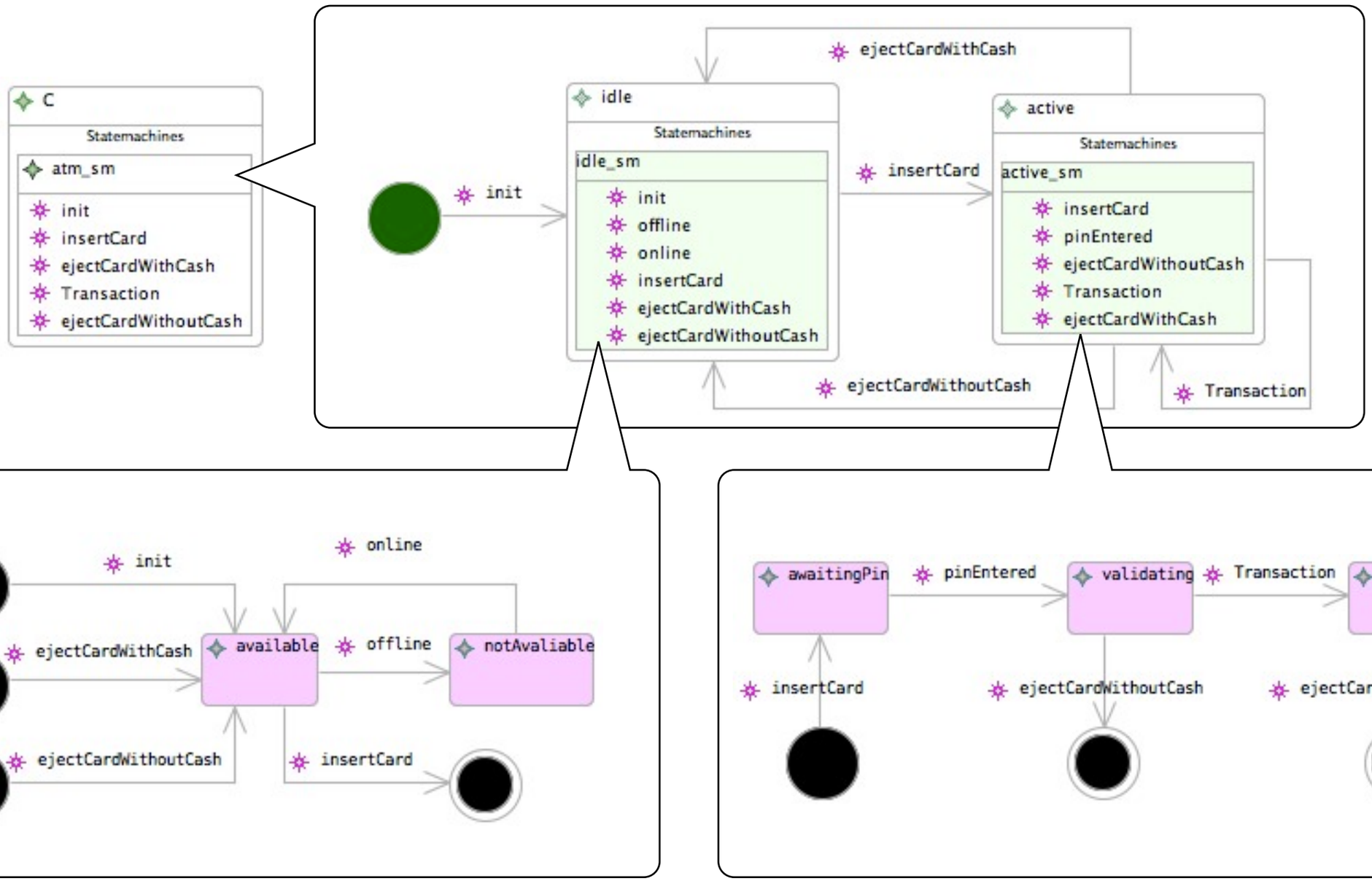
Animation Example: ATM



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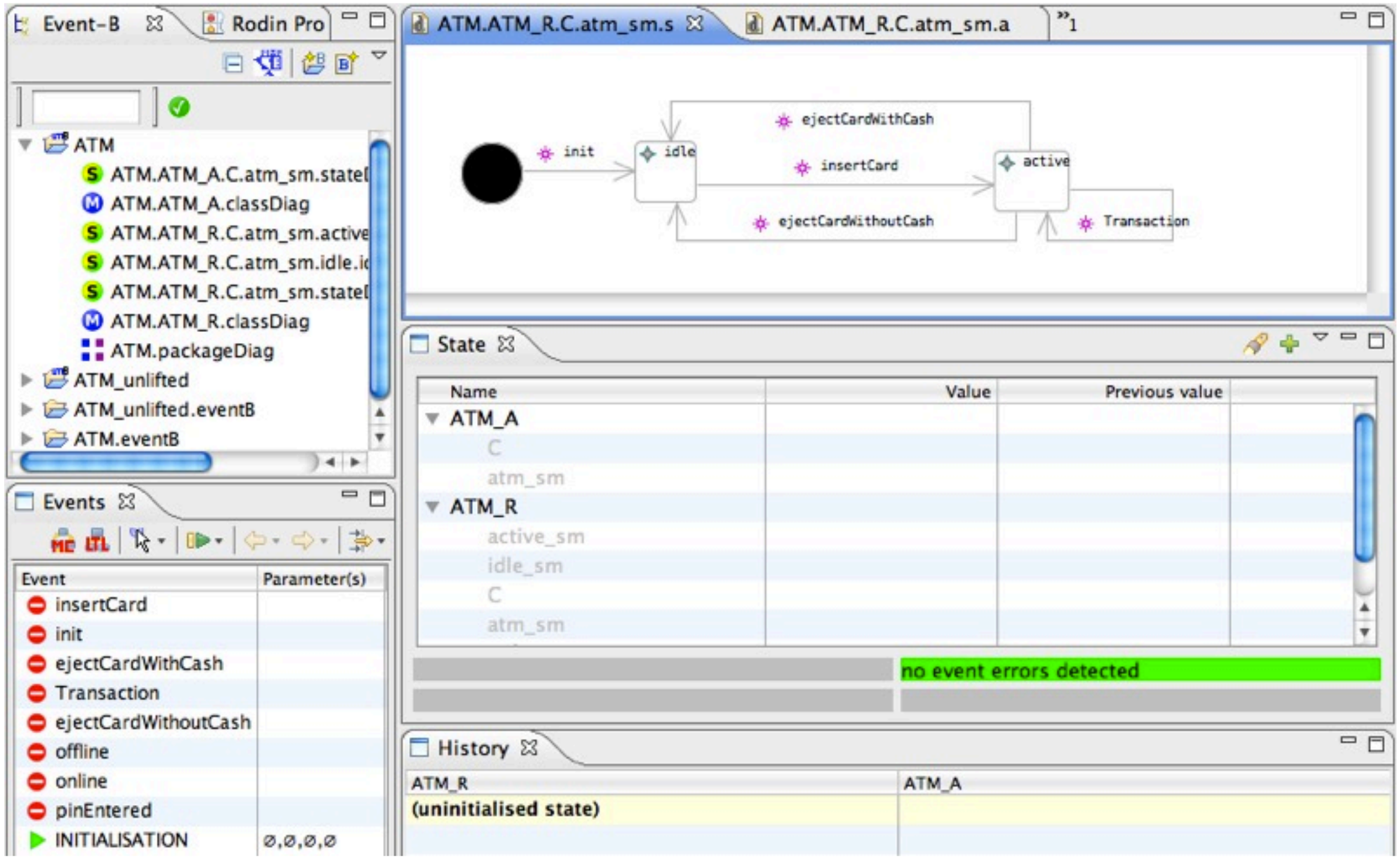
Animation Example: ATM (start)



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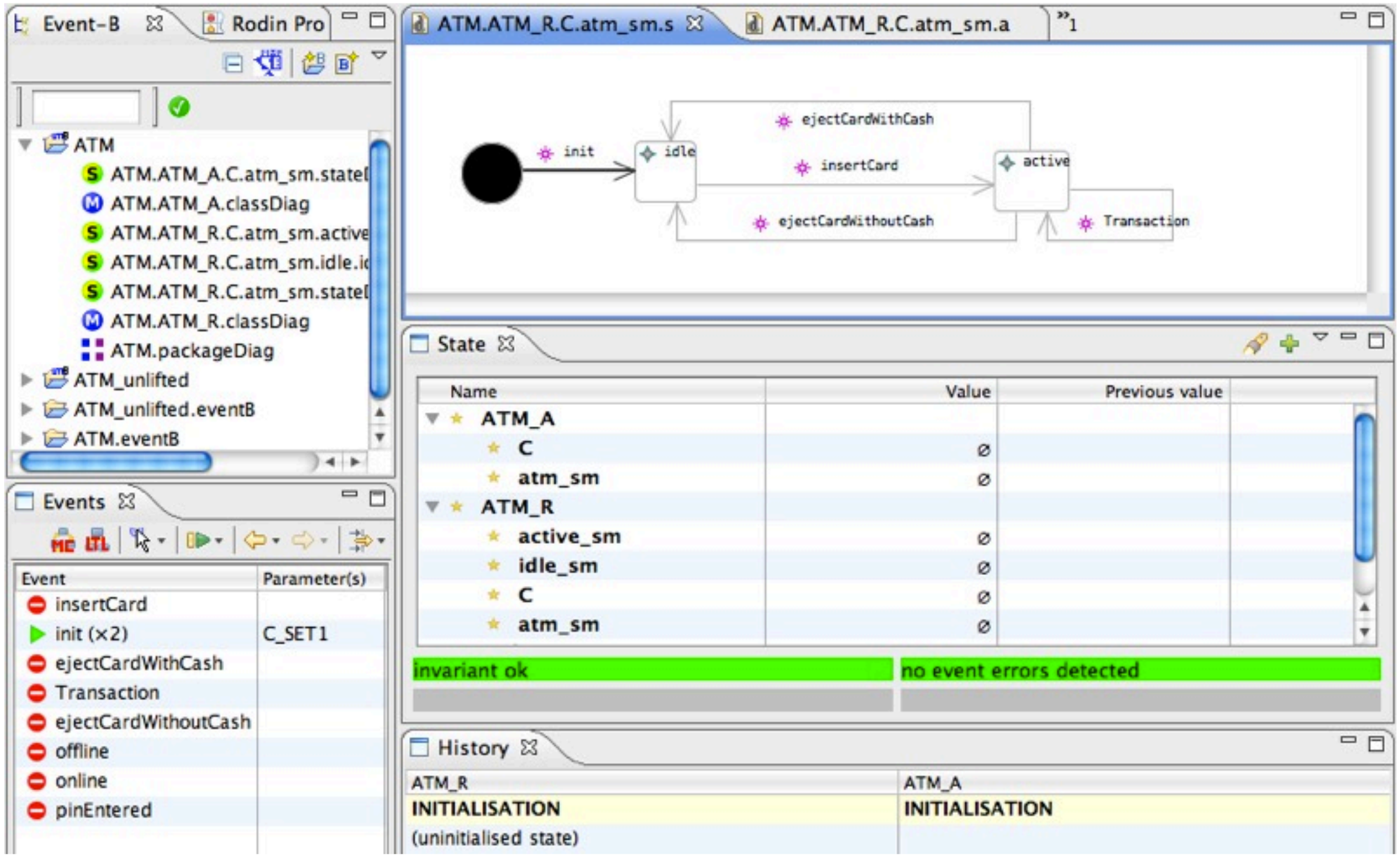
Animation Example: ATM (initialisation)



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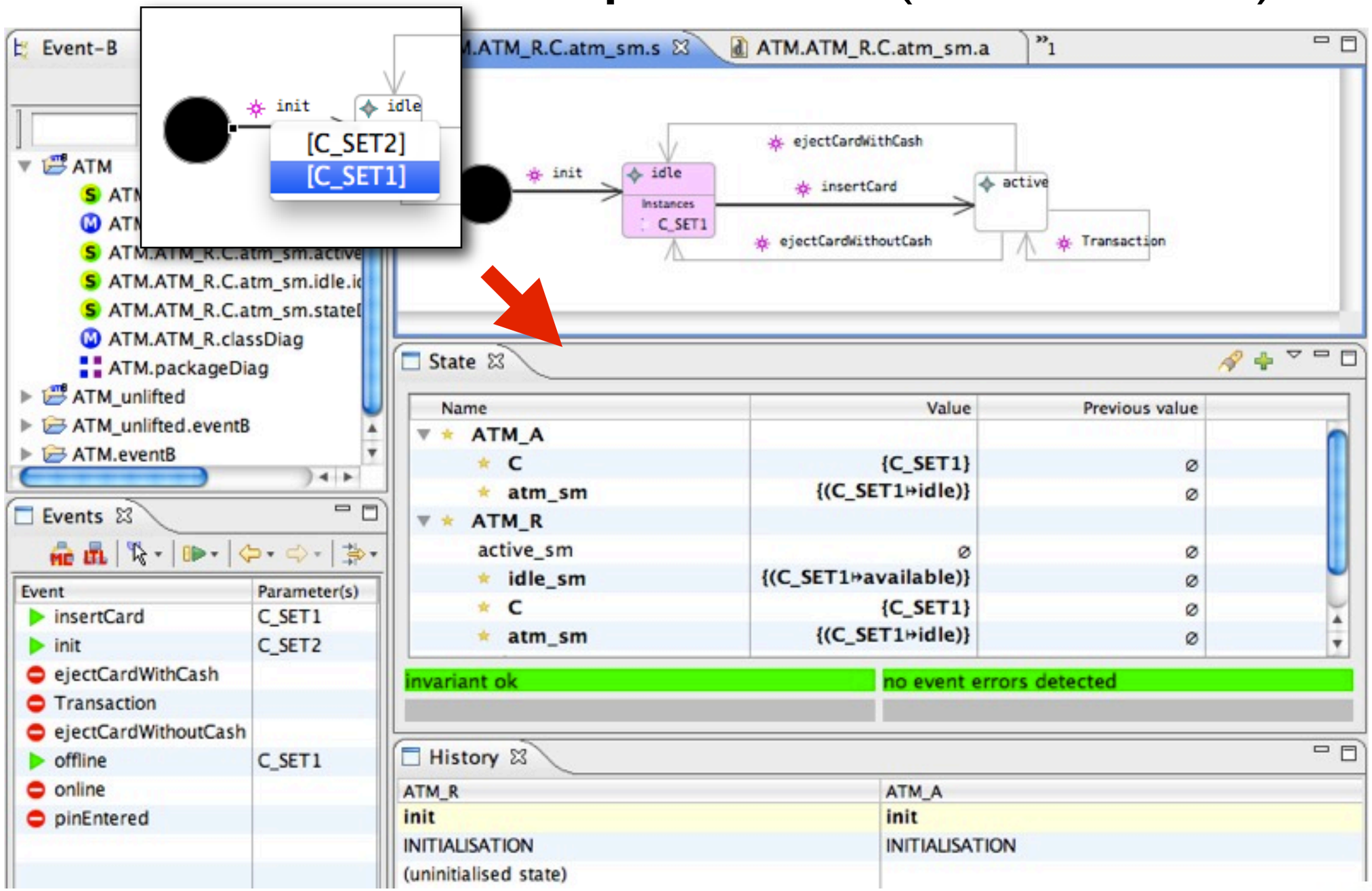
Animation Example: ATM (animation 1)



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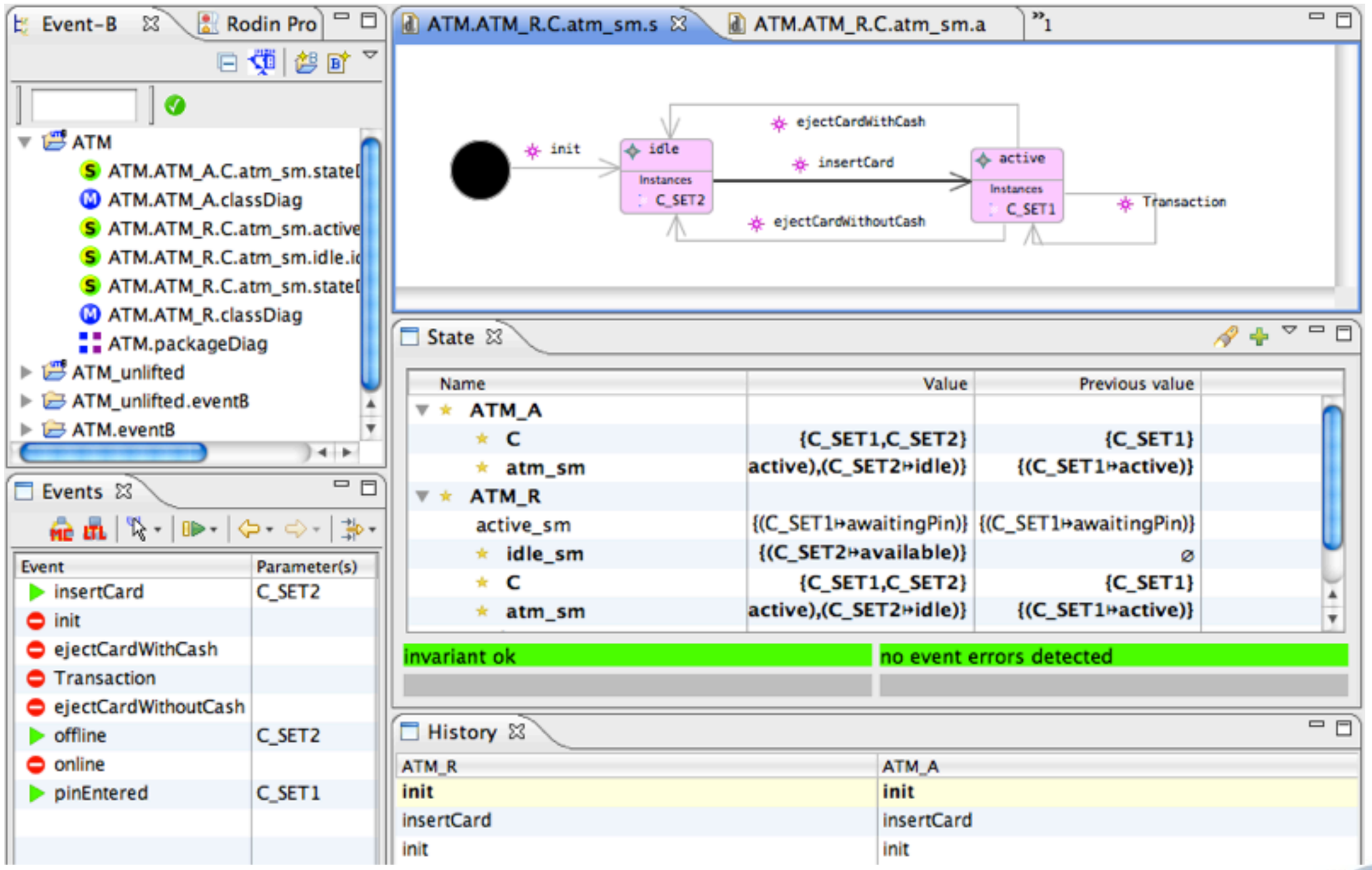
Animation Example: ATM (animation II)



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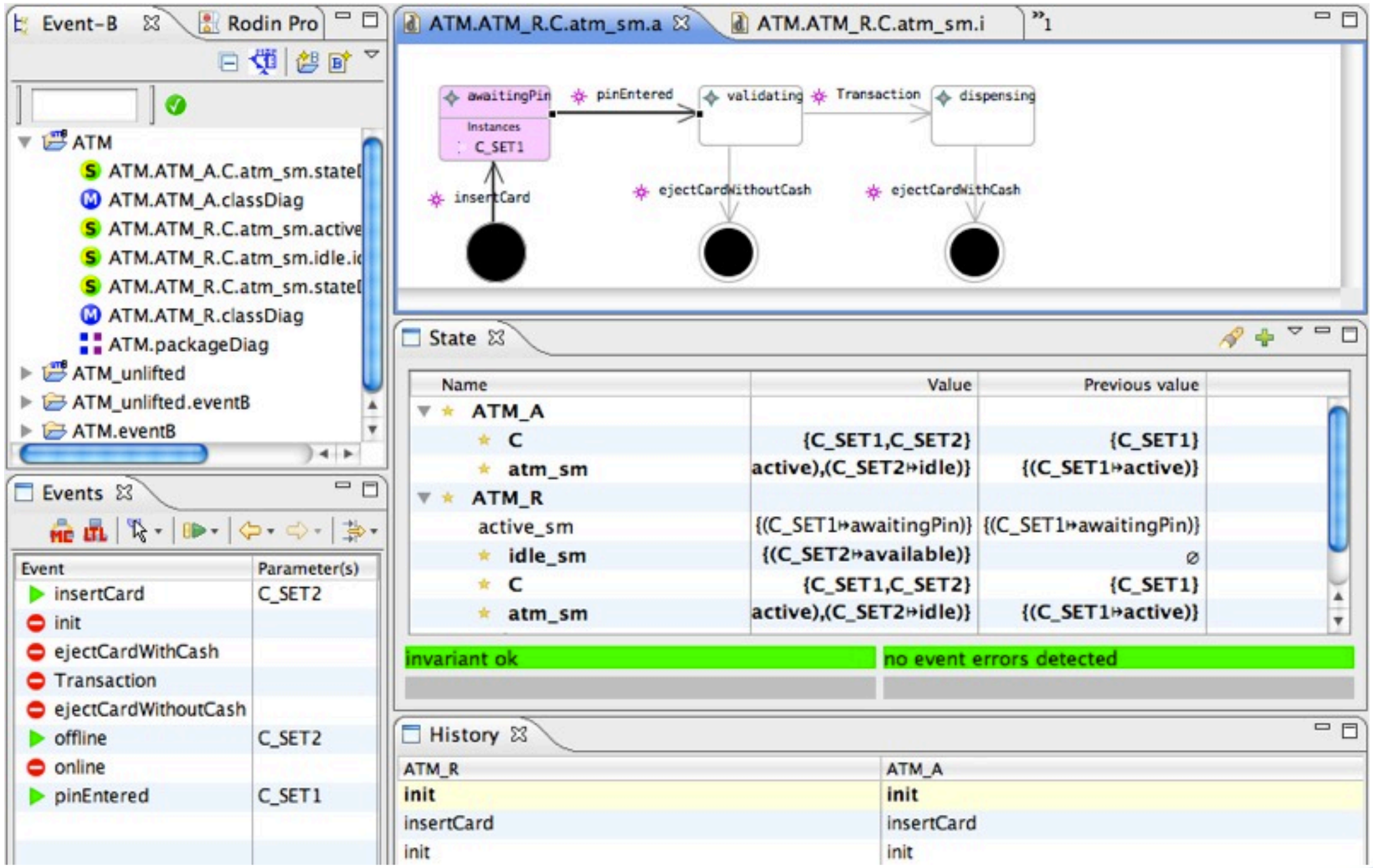
Animation Example: ATM (animation III)



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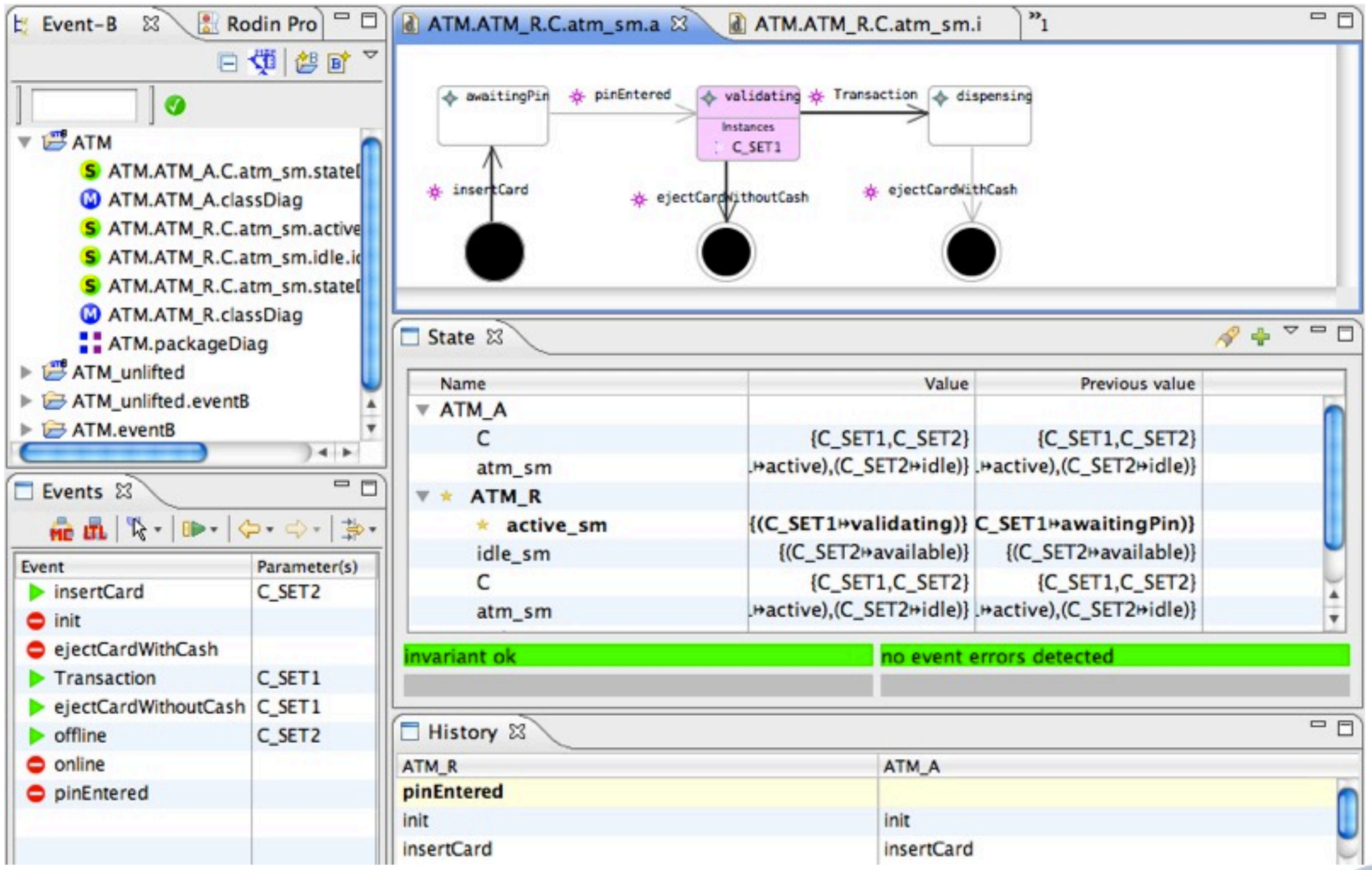
Animation Example: ATM (animation IV)



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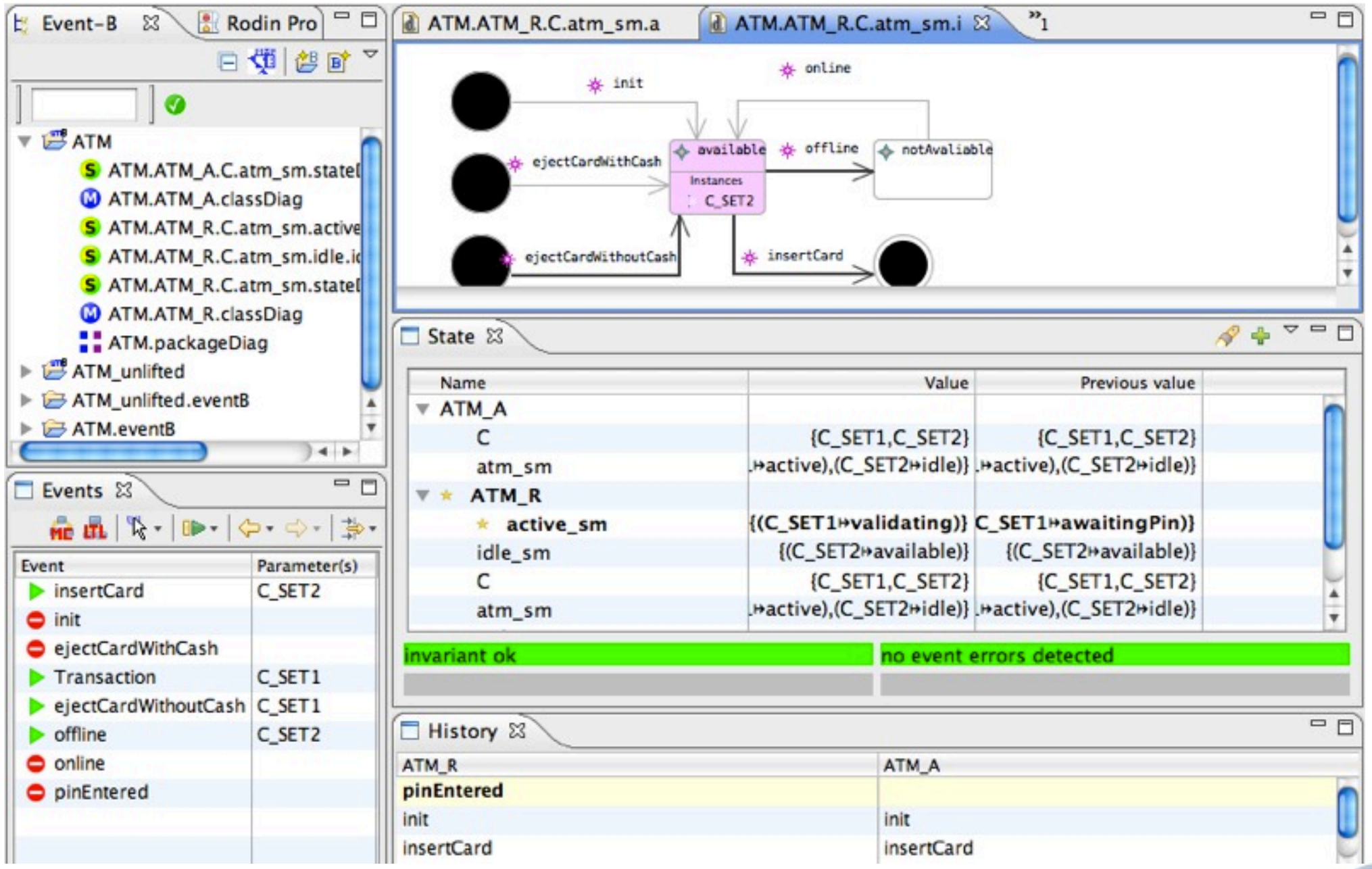
Animation Example: ATM (animation V)



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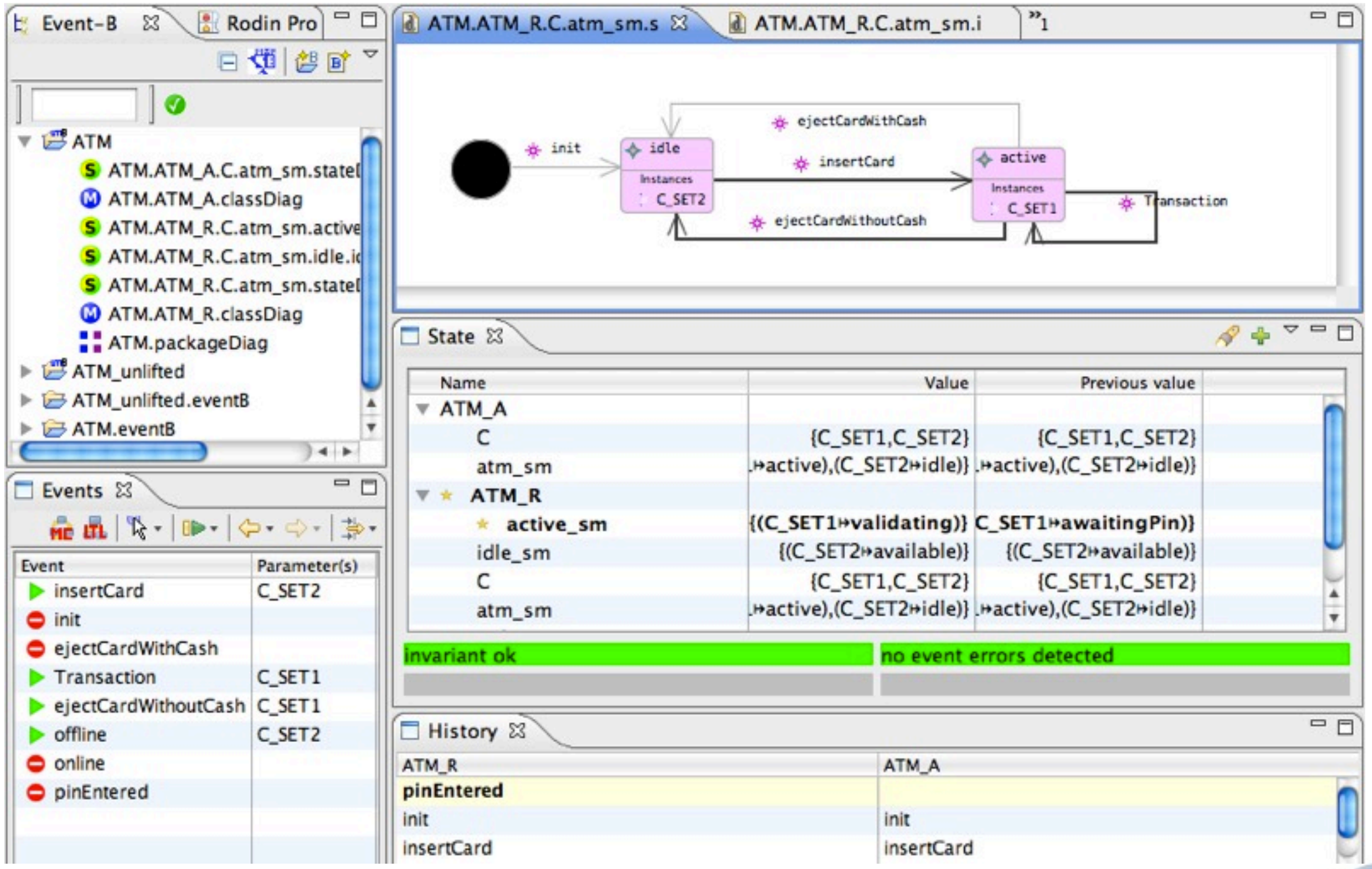
Animation Example: ATM (animation VI)



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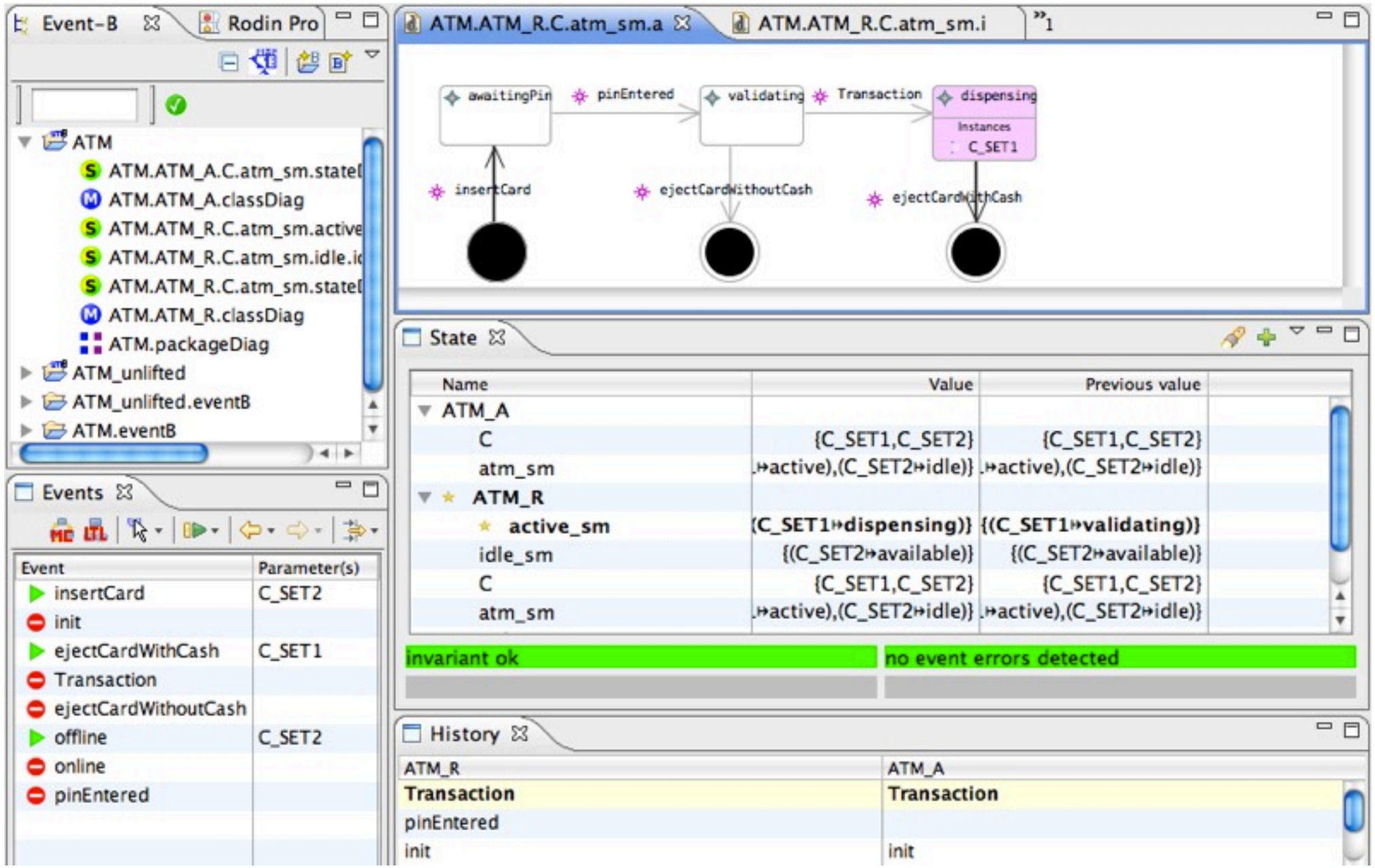
Animation Example: ATM (animation VII)



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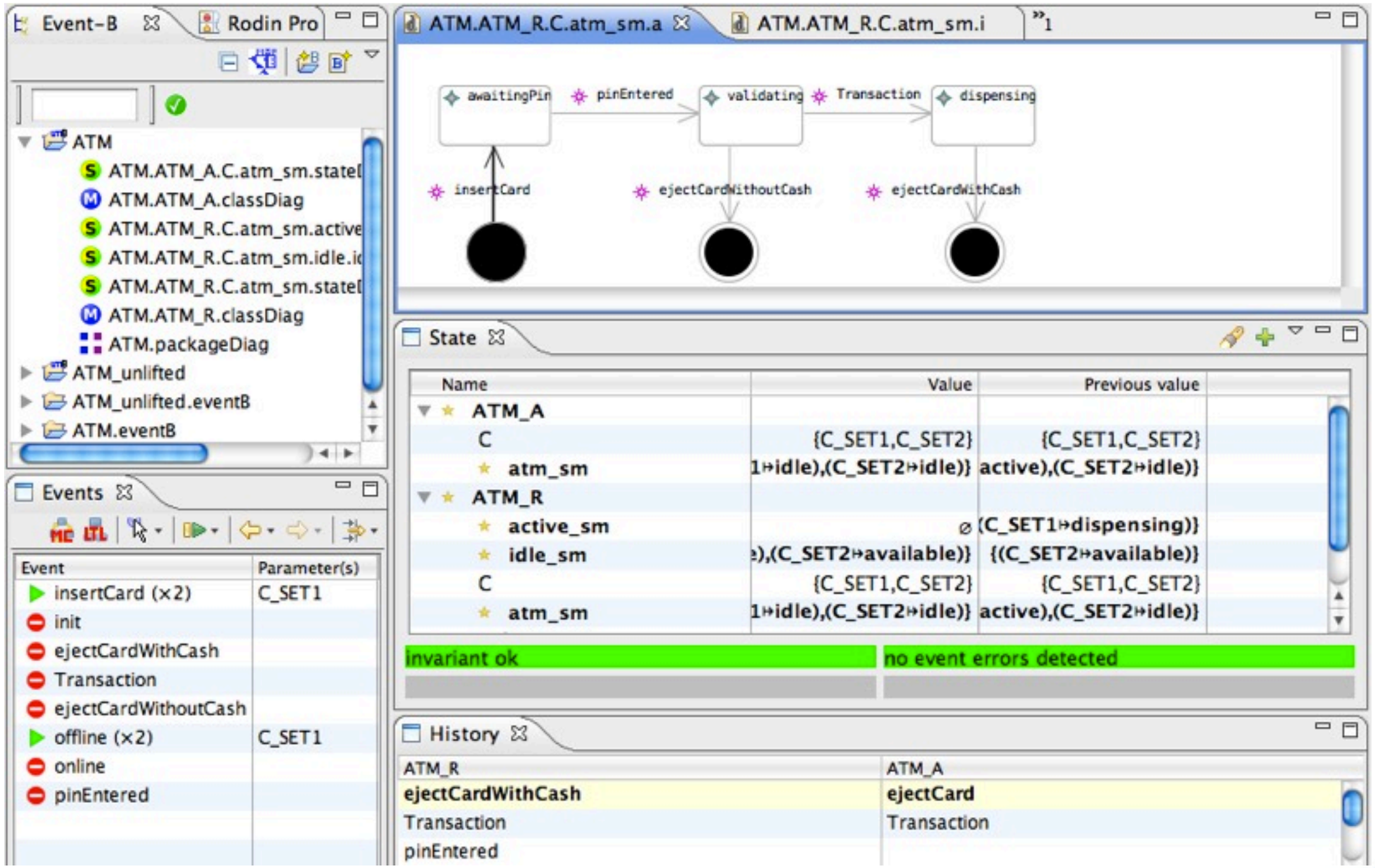
Animation Example: ATM (animation VIII)



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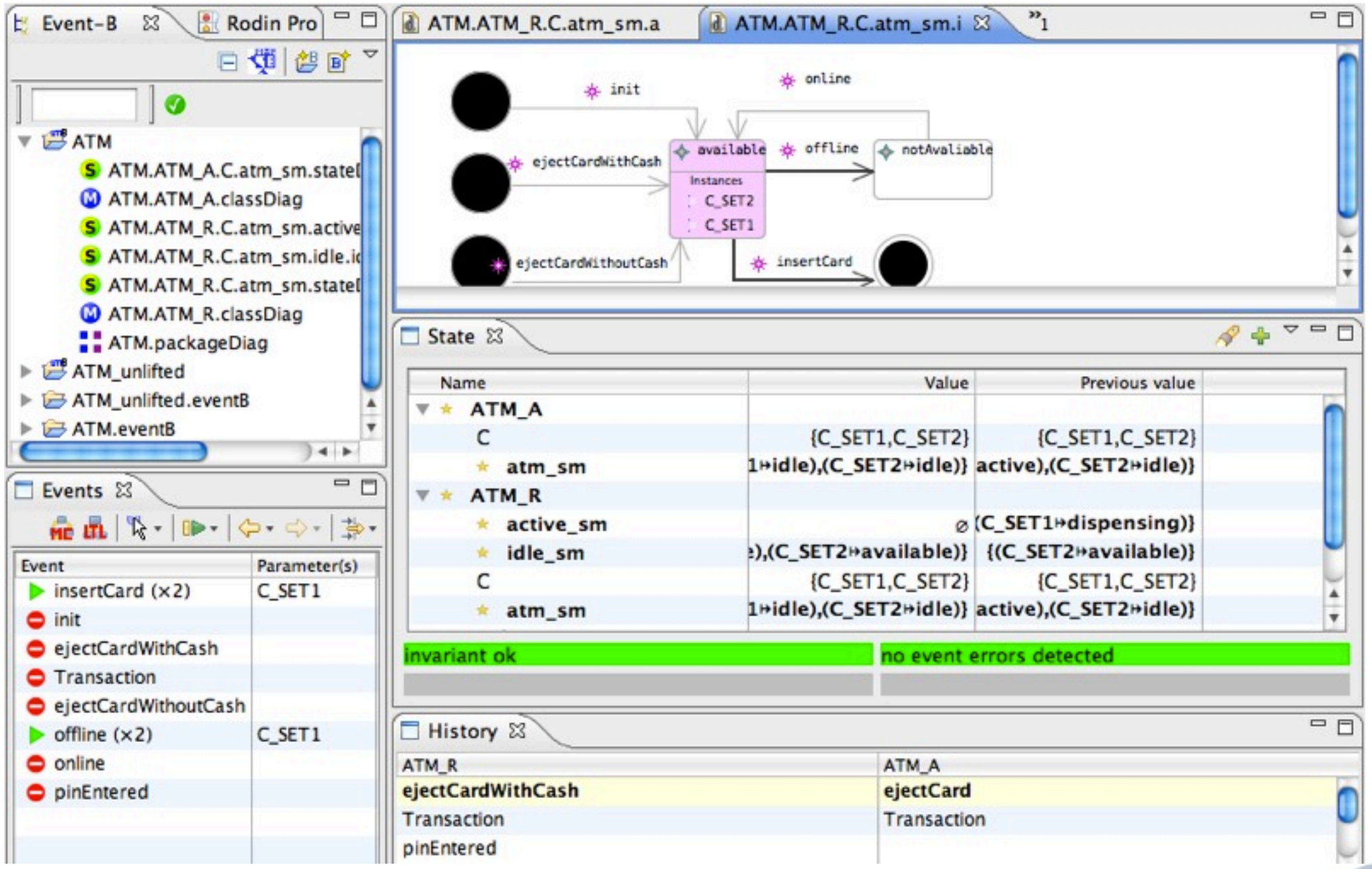
Animation Example: ATM (animation IX)



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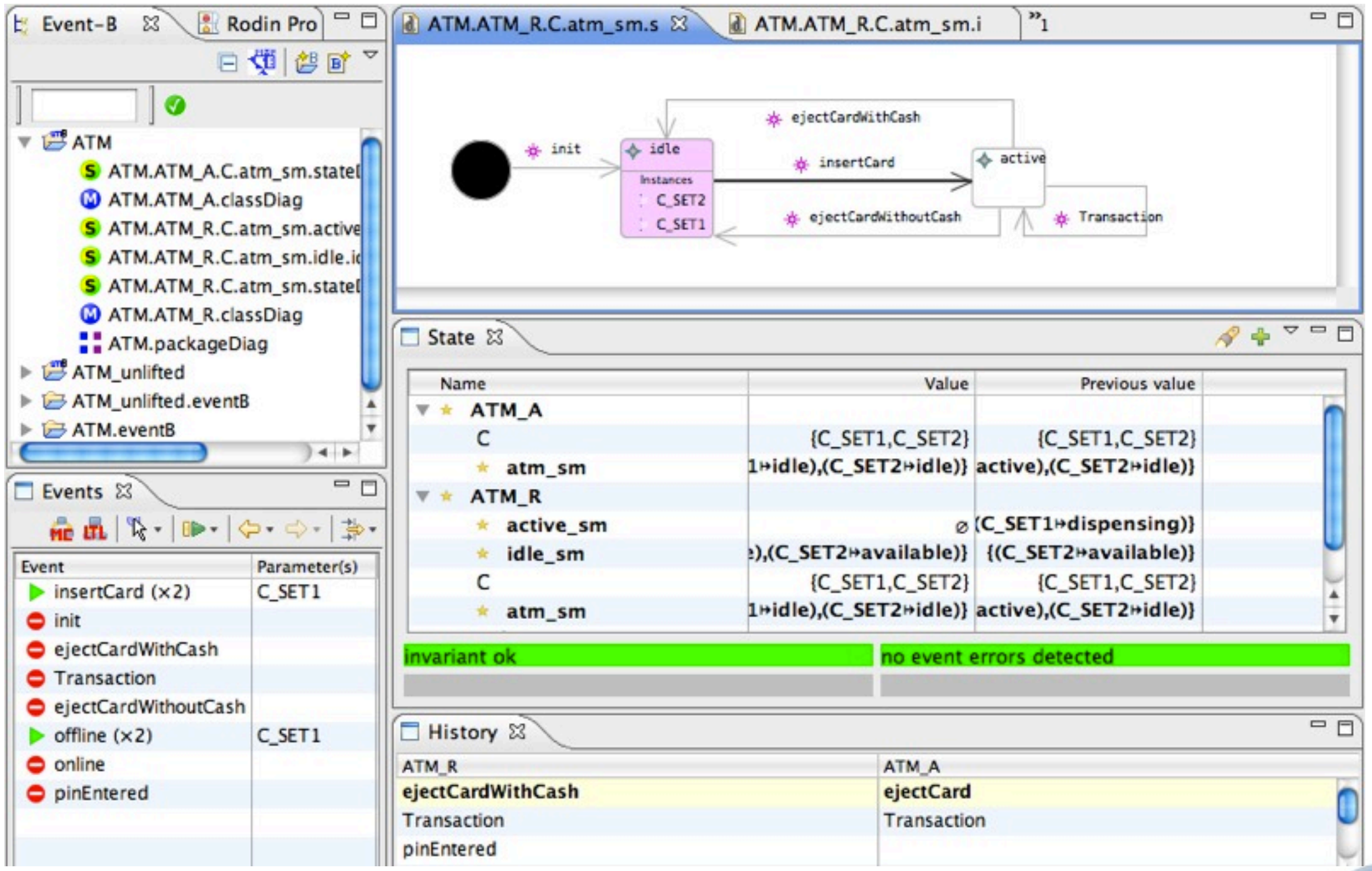
Animation Example: ATM (animation X)



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Summary

- Developing a useful tool that extends the functionality of other Rodin tools is relatively easy
- State-machine Animation elaborates the visualisation of UML-B diagrams with the aid of ProB Animator
- Animation and verification of Event-B models becomes more obvious

Future Plans

- Maintain Animation tool after the realisation of UML-B refactoring plans
- Consolidate Class diagram animation ideas and integrate them into existing Animation tool

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Thank You!