we want to test **deeper** stages of programs.

**Key idea 1: Parametric Generators**

Bit flips on parameters $\rightarrow$ Structural mutations on inputs

**Key idea 2: Validity Fuzzing (with Parametric Generators)**

Validity fuzzing $+$ Parametric Generators

**Evaluation**

Total 18 new bugs reported

- 7 unique to Zest!
- Within 10 minutes on average

Example:

Semantic Bug in Closure

```java
while ((l_0) { 
    if ((l_0) { 
        break; var l_0; continue 
        break; var l_0 
    }
}
```

Unreachable statement, but not dead code!