Smart L1ID Forwarding

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Test strategy

Bug found in Smart_L1ID Firmware → pending trigger counter was **decremented too many times**

New FW version generated and tested in **C1_S7** because of "**high occupancy**" → desynchronization produced when running with modules on, **suited to test new algorithms**
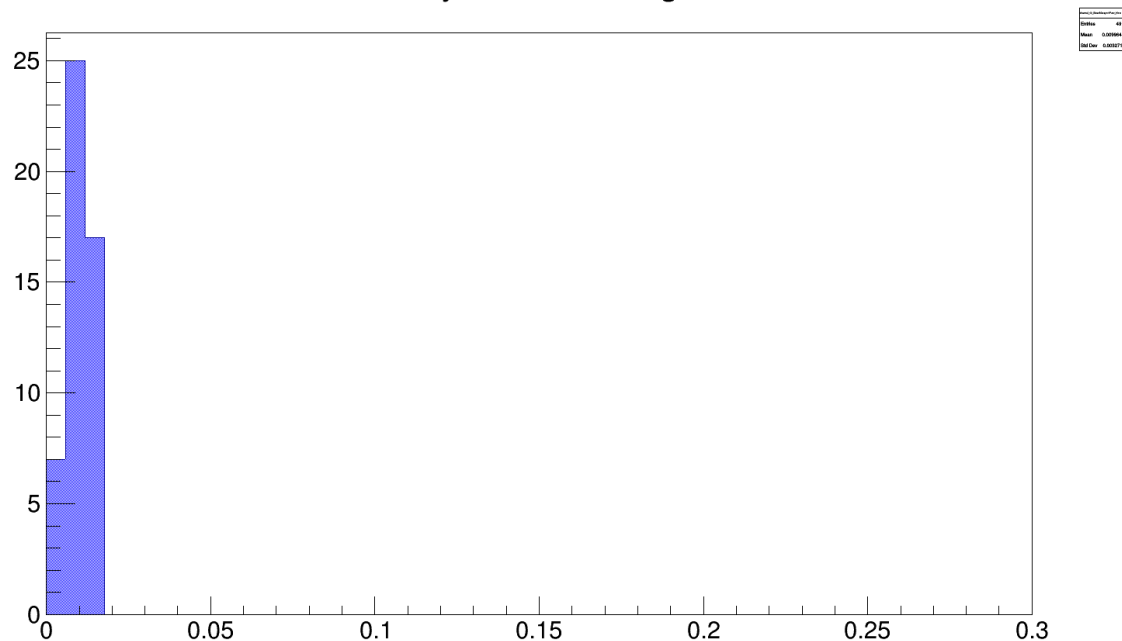
2 scenarios:
- **30KHz** → "small" and controlled level of desynch produced
- **60KHz** → high and uncontrolled level of desynch produced

Tested with different "pending triggers thresholds" →
- **Mechanism OFF** (official FW behavior)
- **16 pending triggers** (should be equivalent to skipped trigger threshold)
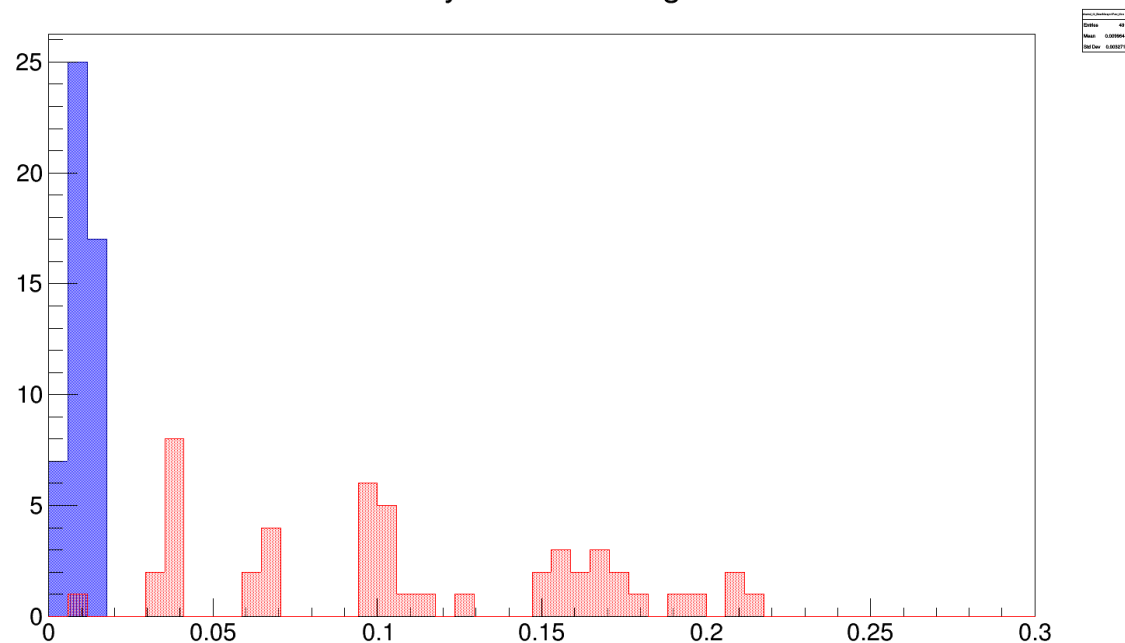
FW Comparison, 30KHz

Desynch Percentage histo

- **Blue**: Mechanism OFF

Small percentage of desynchronization
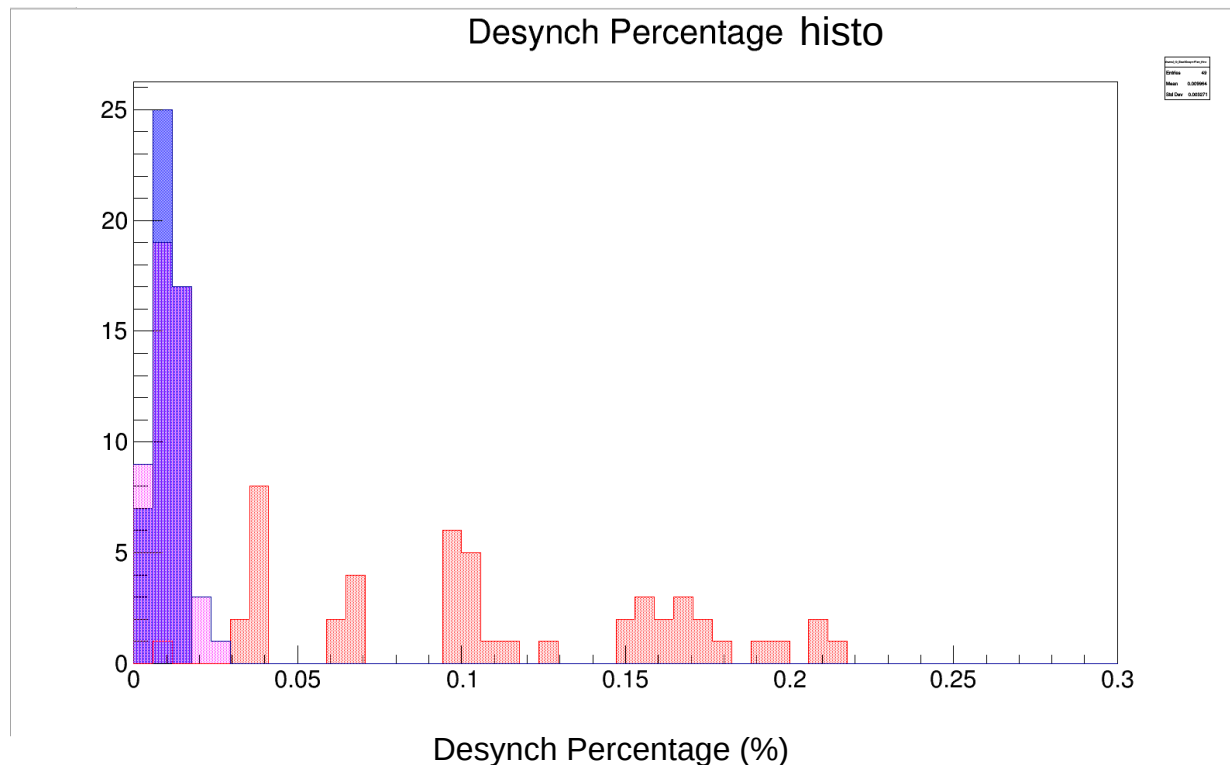
FW Comparison, 30KHz (1)

Desynch Percentage histo

- **Blue**: Mechanism OFF
- **Red**: "Old FW", threshold = **16 pending triggers**
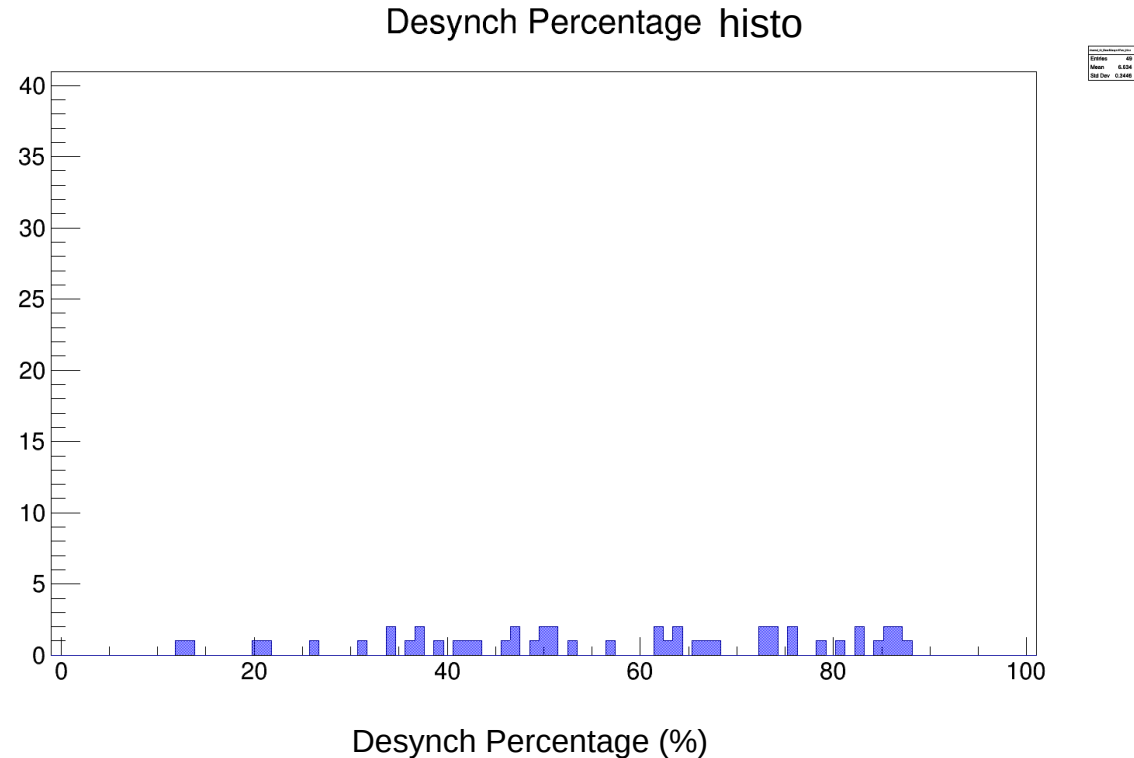
Higher percentage of desyncronization

FW Comparison, 30KHz (2)

Desynch Percentage histo

- **Blue**: Mechanism OFF
- **Red**: "Old FW", threshold = **16 pending triggers**
- **Purple:** "New FW", threshold = **16 pending triggers**

Same behavior as mechanism OFF

FW Comparison, 60KHz

Desynch Percentage histo
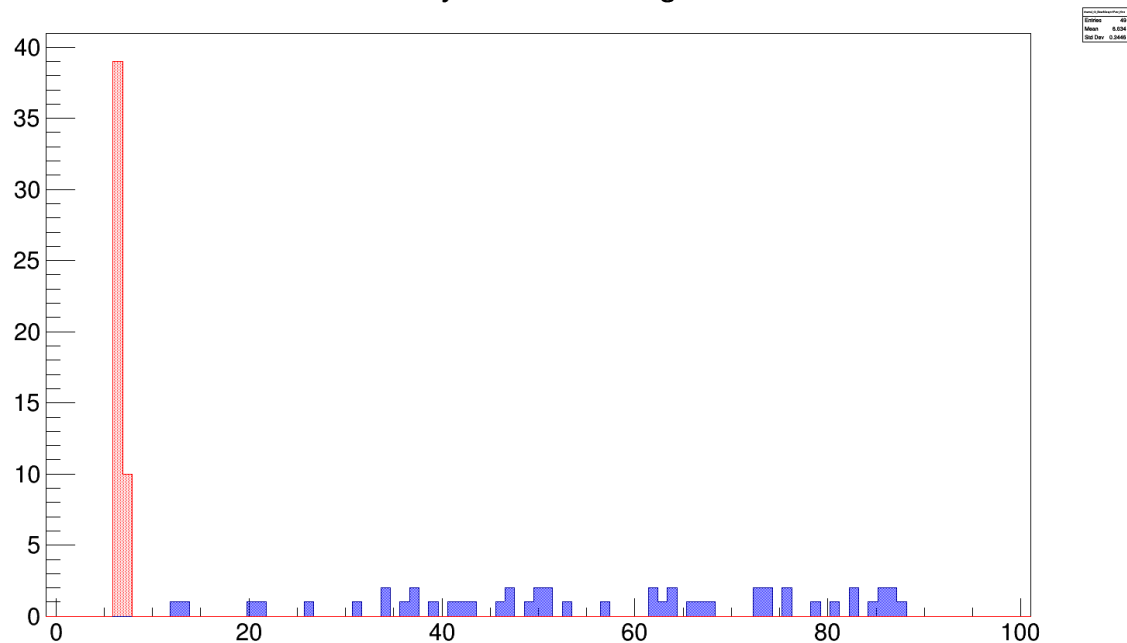

Desynch Percentage (%)

- **Blue**: Mechanism OFF

High amount of desynchronization, spread uniformly
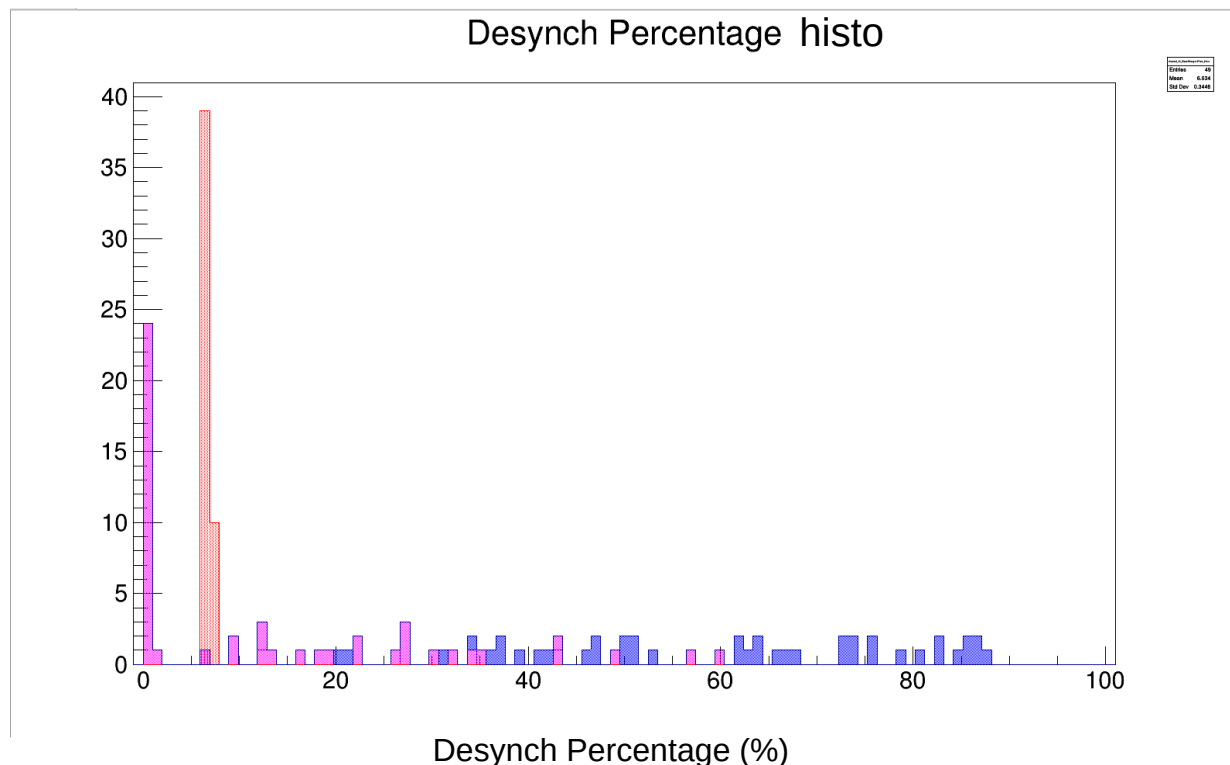
FW Comparison, 60KHz (1)

Desynch Percentage histo

Desynch Percentage (%)

- **Blue**: Mechanism OFF
- **Red**: "Old FW", threshold = **16 pending triggers**

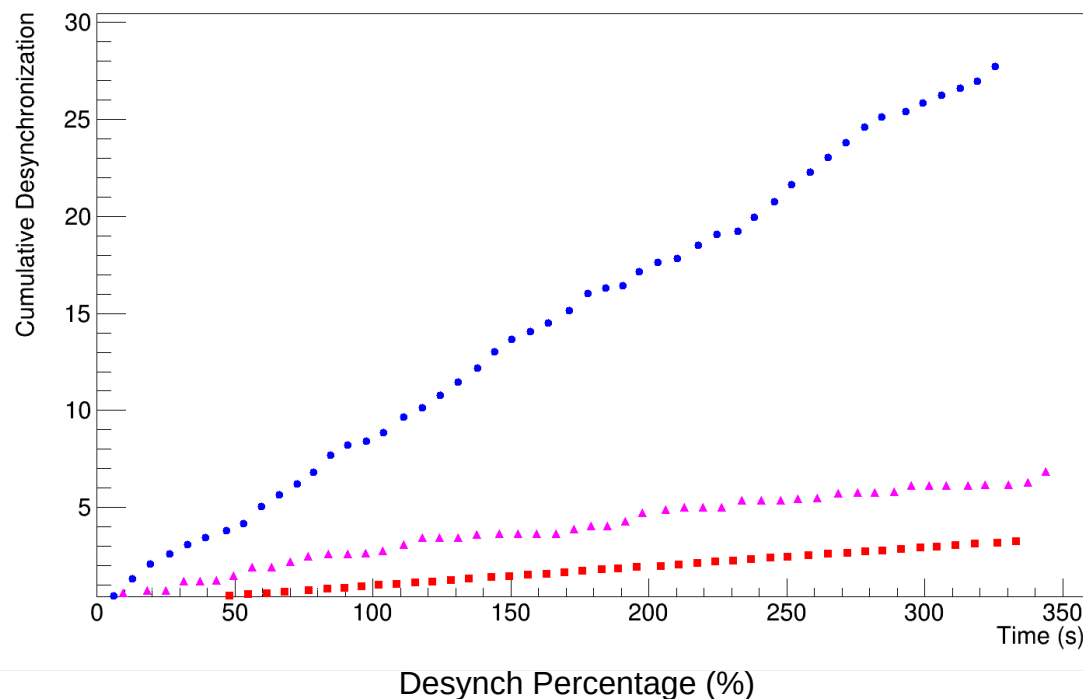**~10% desynchonization** very stable

FW Comparison, 60KHz (2)

Desynch Percentage histo

- **Blue**: Mechanism OFF
- **Red**: "Old FW", threshold = **16 pending triggers**
- **Purple:** "New FW", threshold = **16 pending triggers**

Desynchronization peaked at "0%", but **spikes of higher desynch** (timeout??)

FW Comparison, 60KHz (2)

channel_10_SlaveB.txthisto

- **Blue**: Mechanism OFF
- **Red**: "Old FW", threshold = **16 pending triggers**
- **Purple**: "New FW", threshold = **16 pending triggers**

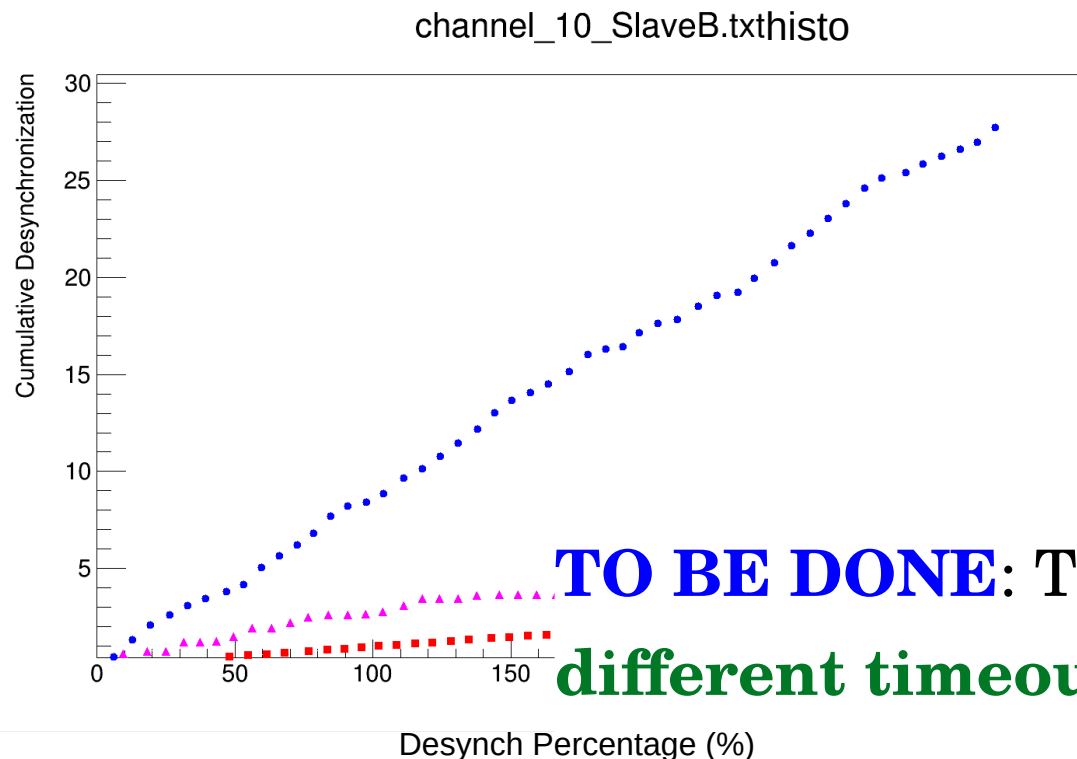**New version look worse** than previous one (bug in the FW), because of **Desynch spikes**

FW Comparison, 60KHz (2)

channel_10_SlaveB.txthisto

- **Blue**: Mechanism OFF
- **Red**: "Old FW", threshold = **16 pending triggers**
- **Purple:** "New FW", threshold = **16 pending triggers**

New version look worse previous one (bug in the because of **Desynches**

TO BE DONE: Test with **different timeout settings**