**IceCube Institutional Memorandum Of Understanding (MOU)**

**Scope of Work**

**Kansas University**

**Dave Z. Besson**

**Ph.D Scientists** (Faculty Scientist/Post Doc Grads): **1** (1 0 2)

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Labor Cat.** | **Names** | **WBS L3** | **Tasks** | **WBS 2.1** | **WBS 2.2** | **WBS 2.3** | **WBS 2.4** | **WBS 2.5** | **WBS 2.6** | **Grand Total** |
| Program Coordination | Detector Maintenance & Operations | Computing & Data Management | Data Processing & Simulation | Software | Calibration |
| KE | BESSON, DAVE  (Professor) | 2.6.1 Detector Calibration | Development of four radio-frequency pulsers for IceCube upgrade |  |  |  |  |  | 0.30 | 0.30 |
|  | BESSON, DAVE (total) | |  |  |  |  |  |  | **0.30** | **0.30** |
| GR | Brendon Madison (grad) | 2.6.1 Detector Calibration | Development of four radio-frequency pulsers for IceCube upgrade |  |  |  |  |  | 0.15 | 0.15 |
|  | Mitch Magnuson (grad) | 2.6.1 Detector Calibration | Development of four radio-frequency pulsers for IceCube upgrade |  |  |  |  |  | 0.15 | 0.15 |
|  | **Total** | |  |  |  |  |  |  | **0.30** | **0.30** |
| **KU Total** | |  |  |  |  |  |  |  | **0.60** | **0.60** |

**Faculty:**

Dave Z. Besson (0.3 FTE): Development of high-voltage RF transmitters for deployment with Upgrade; in-situ radio pulser studies from pinger deployed into SPICE core hole (following prior studies in 2018 and 2019); ice properties calibration. Source of Support: University of Kansas and Moscow Engineering Physics Institute Faculty, Summer salary: None

**Grad:**

Brendon Madison (0.15 FTE): Development of high-voltage RF transmitters, with emphasis on piezo and transistor array technologies.

Mitch Magnuson (0.15 FTE): Mechanical design, testing and verification of South Pole University of Kansas Pressure Vessel Antenna (SPUNK PVA)

Note: Every member of Kansas group, is supported through non-IceCube funding and therefore should be considered as in-kind contribution. Kansas contribution is 100% *pro bono*