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

**Scope Of Work**

**Universität Dortmund**

**Wolfgang Rhode**

**Ph.D Scientists** (Faculty Scientist/Post Doc Grads): **2** (1 1 5)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 |
| SC | RUHE, TIM | Online Filter (Pnf) | Physics filters |  | 0.20 |  |  |  |  | 0.20 |
|  | **RUHE, TIM Total** | |  |  | **0.20** |  |  |  |  | **0.20** |
| GR | DTMD GR | Detector Monitoring | Detector Monitoring |  | 0.03 |  |  |  |  | 0.03 |
|  | WERTHEBACH, JOHANNES | Simulation  Production | Simulation production site manage at Dortmund |  |  |  | 0.50 |  |  | 0.50 |
|  | HOINKA, TOBIAS | Simulation Software | PROPOSAL -IceProd integration and optimization |  |  |  |  | 0.30 |  | 0.30 |
|  | SOEDINGREKSO,  JAN | Simulation Software | PROPOSAL-IceProd  Integration and optimization |  |  |  |  | 0.50 |  | 0.50 |
|  | HÜNNEFELD,  MIRKO | Online Filter | Reconstruction |  | 0.30 |  |  |  |  | 0.30 |
|  | **Ph.D. Students Total** | |  |  | **0.53** |  | **0.30** | **1.00** |  | **1.83** |
| **DTMND Total** | |  |  |  | **0.73** |  | **0.30** | **1.00** |  | **2.03** |

**Faculty:**

Wolfgang Rhode

**Scientists and Postdocs:**

Tim Ruhe  Filtering WBS 2.4 with 0.2 FTE

Analysis topics: Machine learning and two dimensional unfolding of various signals

**PhD Students (100% IceCube):**

Mirco Hünnefeld 🡪 Online Reconstruction WBS 2.4 with 0.3 FTE

Thesis/Analysis topics: Energy and direction reconstruction with deep neural networks.

Tobias Hoinka 🡪 2.5 PROPOSAL integration with 0.3 FTE

Thesis/Analysis topics: Measurement of Pi/K-ratio, maintenance of an atm. neutrino sample.

Johannes Werthebach 🡪 Local MC Production WBS 2.3 with 0.5 FTE

Thesis/Analysis topics: Unfolding of HE atm. muon spectrum.

Jan Soedingrekso 🡪 PROPOSAL Optimization and integration WBS 2.4 with 0.5 FTE

Thesis/Analysis Topic: Cross Section Measurements for HE muons

**General:**

The Dortmund group uses local resources (LiDO, DGRZR) for IceCube Monte Carlo production.

**Computing Resources:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 2019 | | 2020 | |
|  | CPU Cores | GPU Cards | CPU Cores | GPU Cards |
| IceCube | 400 | (40) | 800 | 40 |
| PINGU | --- | --- | --- | --- |
| Gen2 | --- | --- | --- | --- |

**Note: The numbers correspond to the number of CPUs/GPUs that should be available for IceCube simulation on average. The total number of CPUs is larger by a factor of 10 but has to be shared with other experiments and departments. The numbers in parenthesis correspond to the number of cores, which is available but cannot yet be used for IceCube due to delays in the account administration, but will be available very soon.**