Status of preparations for HIC and STAVE assembly at LHEP JINR

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Encounter of the Russian branch of the MPD-ITS project
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HIC and STAVE Overview, Status & Plans

OUTLINE

• Assembly stages of OB ITS MPD
• HICs assembly site preparation
  • Workflow of HIC assembly
  • Preparation of workplaces in room 102 for the assembly of HIC;
  • Revision and manufacturing of special tools for assembly HIC;
  • Components and equipment for assembly HIC from CERN.
  • Delivery of components and equipment for assembly HIC.
• STAVEs assembly site preparation
  • JINR LHEP area for assembly STAVEs
• Planning and current results
Assembly stages of OB ITS MPD

1. ALPIDE chips
2. Flexible Printed Circuit (FPC)
3. Hybrid Integrated Circuits (HIC)
4. STAVE

Layer 4 = 18 STAVEs
Layer 5 = 24 STAVEs
HICs assembly site preparation

Workflow of HIC assembly

First stage
- Preparing FPC for assembly
  - Measurement of FPC on Mitutoyo machine
  - FPC signal line's resistance measurement
  - Soldering of cross cables to FPC
  - FPC cleaning
- ALPIDE visual inspection

Assembly stage
- Assembly ALPIDE chips in ALICIA8
- Gluing Chips to FPC
- Wire bonding on Delvotec
- Peel test of HIC

Testing
- IV curve measurement
- Test with IR Camera
- Electrical test of Single HIC
- Endurance test of 10 HICs
HICs assembly site preparation

Preparing FPC for assembly
- Measurement of FPC on Mitutoyo machine
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HICs assembly site preparation

- Assembly ALPIDE chips in ALICIA8
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HICs assembly site preparation

- IV curve measurement
- Functional Test
- Test with IR Camera
HICs assembly site preparation

- Electrical test of Single HIC
HICs assembly site preparation

- Endurance test of 10 HICs
HICs assembly site preparation

Preparation of workplaces in room 102 for the assembly of HIC

Main workplaces for HIC assembly:

- Workplace of the operator ALICE A8
- HIC assembly table
- Wire bonding workplace
- Pull test workplace
- Test area for measuring IV curve of HICs
- Single HIC test bench
- HICs endurance test bench
- Peel test workplace
- Storage area
HICs assembly site preparation

Preparation of workplaces in room 102 for the assembly of HIC
HICs assembly site preparation

Components and equipment for assembly HIC from CERN.

CERN contract P134, Addendum 4

<table>
<thead>
<tr>
<th>No</th>
<th>Name of the component</th>
<th>Photo</th>
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<tbody>
<tr>
<td>1</td>
<td>ALICE ITS OB assembly table for the ALICE4 machine</td>
<td><img src="image" alt="Assembly Table" /></td>
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<tr>
<td>2</td>
<td>ALICE ITS OB wire bonding table</td>
<td><img src="image" alt="Wire Bonding Table" /></td>
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<tr>
<td>3</td>
<td>ALICE ITS OB module gripper</td>
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<td>4</td>
<td>ALICE ITS OB FPGA gripper</td>
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<td>5</td>
<td>ALICE ITS OB glue module gripper</td>
<td><img src="image" alt="Glue Module Gripper" /></td>
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<td>6</td>
<td>ALICE ITS OB HIC cooling plates</td>
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<td>7</td>
<td>ALICE ITS OB HIC glue masks</td>
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<td>8</td>
<td>Custom made test crate for single HIC</td>
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<tr>
<td>9</td>
<td>Custom made test crate for 10 HICs</td>
<td><img src="image" alt="Test Crate" /></td>
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<tr>
<td>10</td>
<td>MOSAIC boards</td>
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<td>11</td>
<td>ALICE Custom Made Power Board</td>
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<td>12</td>
<td>MOSAIC Custom Core</td>
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<tr>
<td>13</td>
<td>Adapter Boards</td>
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<tr>
<td>14</td>
<td>Power Adapters</td>
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HICs assembly site preparation

Revision and manufacturing of special tools for assembly HIC;

- Revision of special tooling for ALICIA8
- Manufacturing of jig for soldering FPC

Chip Tray clamp and screws for ALICIA8

Chip Tray frame for ALICIA8

FPC soldering tool
HICs assembly site preparation
Delivery of components and equipment for assembly HIC.

SwissPCB (Swiss PCB, Switzerland)
Delivery time June 2020

Supply system (CAEN, Italy)
Delivery time June 2020
HICs assembly site preparation
Delivery of components and equipment for assembly HIC.

Testing System for FPC (INFN Catania Italy).
Delivery time June 2020

Probe card for OB FPC (Technoprobe SPA Italy)
Delivery time July 2020
HICs assembly site preparation

Delivery of components and equipment for assembly HIC.

Contract of Delvotec M17S (F&K DELVOTEC Bondtechnik GmbH Germany). Delivery time October 2020

Peel test machine (Macberry, Great Britain). Delivery time August 2020
STAVEs assembly site preparation

JINR area for assembly STAVES

• Work areas will be organized in a clean room of building 217

• The Mitutoyo machine was received and kept at the LHEP storage

• We will organize 6 workplaces for STAVEs assembly
STA VEs assembly site preparation

Planning and current results:

- Awaiting delivery of dummy ALPIDE chips for prepare manufacturing lines in JINR LHEP;
- Delivery of main assembly components from CERN (Contract P134);
- The main assembly machines will be received and adjust in the 3rd quarter of 2020;
- Waiting final assembly of TPC for starting prepear STA VE assembly area;