

## The HypHI Phase 0 experiment \*

T.R. Saito<sup>†1,2</sup>, S. Bianchin<sup>1</sup>, O. Borodina<sup>1,2</sup>, V. Bozkurt<sup>1,3</sup>, B. Göküzüm<sup>1,3</sup>, M. Kavatsyuk<sup>4</sup>, E. Kim<sup>1,5</sup>, S. Minami<sup>1</sup>, D. Nakajima<sup>1,6</sup>, B. Özel-Tashenov<sup>1,3</sup>, C. Rappold<sup>1,7</sup>, P. Achenbach<sup>2</sup>, S. Ajimura<sup>8</sup>, T. Aumann<sup>1</sup>, C. Caesar<sup>1</sup>, S. Erturk<sup>3</sup>, T. Fukuda<sup>9</sup>, E. Guliev<sup>4</sup>, Y. Hayashi<sup>10</sup>, T. Hiraiwa<sup>10</sup>, J. Hoffmann<sup>1</sup>, G. Ickert<sup>1</sup>, Z.S. Ketenci<sup>3</sup>, D. Khanefit<sup>1,2</sup>, M. Kim<sup>5</sup>, S. Kim<sup>5</sup>, K. Koch<sup>1</sup>, N. Kurz<sup>1</sup>, Y. Ma<sup>2,11</sup>, F. Maas<sup>1,2</sup>, Y. Mizoi<sup>9</sup>, M. Moritsu<sup>10</sup>, T. Nagae<sup>10</sup>, A. Okamura<sup>10</sup>, W. Ott<sup>1</sup>, J. Pochodzalla<sup>2</sup>, A. Sakaguchi<sup>12</sup>, M. Sako<sup>10</sup>, C.J. Schmidt<sup>1</sup>, M. Sekimoto<sup>13</sup>, H. Simon<sup>1</sup>, H. Sugimura<sup>10</sup>, T. Takahashi<sup>13</sup>, G.J. Tambave<sup>4</sup>, K. Tanida<sup>5</sup>, H. Tamura<sup>11</sup>, M. Träger<sup>1</sup>, W. Trautmann<sup>1</sup>, S. Voltz<sup>1</sup>, C.J. Yoon<sup>5</sup>, and K. Yoshida<sup>12</sup>

<sup>1</sup>GSI, Darmstadt, Germany; <sup>2</sup>Johannes Gutenberg Universität Mainz, Mainz, Germany; <sup>3</sup>Nigde University, Nigde, Turkey; <sup>4</sup>KVI, Groningen, The Netherlands; <sup>5</sup>Seoul National University, Seoul, Korea; <sup>6</sup>The University of Tokyo, Tokyo, Japan; <sup>7</sup>Université Louis Pasteur Strasbourg, Strasbourg, France; <sup>8</sup>RCNP, Ibaraki, Japan; <sup>9</sup>Osaka Electro-Communication University, Osaka, Japan; <sup>10</sup>Kyoto University, Kyoto, Japan; <sup>11</sup>Tohoku University, Sendai, Japan; <sup>12</sup>Osaka University, Toyonaka, Japan; <sup>13</sup>KEK, Tsukuba, Japan

The HypHI collaboration has conducted the first physics production experiment, so called "Phase 0" in cave C. In the experiment, projectiles of  ${}^6\text{Li}$  at 2 A GeV with an intensity in average of  $5 \times 10^7$  per spill (10 s spill length) were impinged in a graphite target with a thickness of 8 g/cm<sup>2</sup>. The Phase 0 experiment was divided into two blocks; three days in August for commissioning and 11 days in October for data taking. The main goal of the experiment is to reconstruct events of light hypernuclei as  ${}^3_\Lambda\text{H} \rightarrow {}^3\text{He} + \pi^-$ ,  ${}^4_\Lambda\text{H} \rightarrow {}^4\text{He} + \pi^-$  and  ${}^5_\Lambda\text{He} \rightarrow {}^4\text{He} + \pi^- + p$ .

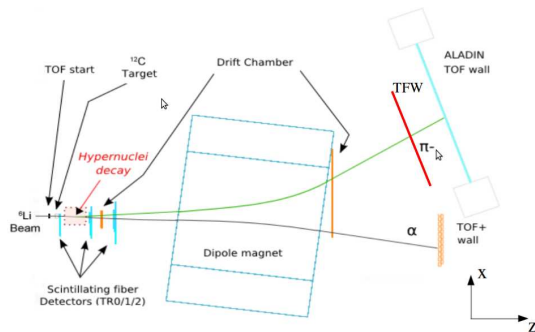


Figure 1: Experimental setup for the Phase 0 experiment

Figure 1 shows a schematic layout of the experimental setup for the October run. Beams are delivered from the left side of the figure. In front of the target, an array of plastic finger detectors, TOF-start, measures the projectiles and defines time-zero for the Time-of-Flight (TOF) measurements [cite]. Behind the target, three arrays of scintillating fiber detectors (TR0, 1 and 2) were used to track charged particles in the horizontal and vertical directions [2, 3]. Between TR1 and TR2, a drift chamber was mounted for tracking charged particles. Since the drift

chamber can not operate under the high beam intensity conditions, a beam killer has been developed by wrapping sense wires by teflon sheets around the beam region [4]. Behind these detectors, charged particles are separated by ALADiN dipole magnet at 0.75 T. Time and hit position of positively charged particles were measured by a TOF wall indicated as TOF+, and negatively charged particles dominated  $\pi^-$  are measured by two additional TOF walls referred as TFW and the ALADiN TOF wall [1]. Behind the ALADiN magnet, there is another drift chamber for tracking charged particles. For this drift chamber, a beam killer has also been implemented by connecting potential and sense wires around the beam region [4].

In the trigger level to the data acquisition system, events with secondary vertex events observed by the scintillating fiber detectors, positively charged particles with  $Z = 1$  and 2 by TOF+, and negatively charged particles by TFW were selected in order to reduce the background events. Details of the trigger are found in ref. [5].

Data analysis is in progress. The current data analysis algorithm employs Hough transform and Kalman filter for the track finding and propagation [6]. Preliminary analyses have already revealed indications of  $\Lambda$ -hyperons and  ${}^5_\Lambda\text{He}$  [7, 8].

## References

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<sup>†</sup> t.saito@gsi.de