

## $(p, p')$ reactions on all even-even and $N=Z$ nuclei of $sd$ -shell region

H. Matsubara<sup>1</sup>, A. Tamii<sup>1</sup>, T. Adachi<sup>1</sup>, J. Carter<sup>2</sup>, M. Dozono<sup>3</sup>, H. Fujita<sup>2</sup>, K. Fujita<sup>1</sup>, Y. Fujita<sup>4</sup>, N. Fujita<sup>5</sup>, K. Hatanaka<sup>1</sup>, D. Ishikawa<sup>1</sup>, M. Itoh<sup>6</sup>, M. Kato<sup>1</sup>, T. Kawabata<sup>7</sup>, S. Kuroita<sup>3</sup>, H. Nakada<sup>8</sup>, K. Nakanishi<sup>7</sup>, P. von Neumann-Cosel<sup>9</sup>, R. Neveling<sup>10</sup>, A. Nonaka<sup>5</sup>, H. Okamura<sup>1</sup>, B. Ozel<sup>9</sup>, I. Poltoratska<sup>9</sup>, A. Richter<sup>9</sup>, B. Rubio<sup>11</sup>, H. Sakaguchi<sup>5</sup>, S. Sakaguchi<sup>7</sup>, Y. Sakemi<sup>6</sup>, Y. Sasamoto<sup>7</sup>, Y. Shimbara<sup>12</sup>, Y. Shimizu<sup>7</sup>, F.D. Smit<sup>10</sup>, K. Suda<sup>1</sup>, Y. Tameshige<sup>1</sup>, K. Tsukiyama<sup>13</sup>, R. Yamada<sup>12</sup>, Y. Yamada<sup>3</sup>, M. Yosoi<sup>1</sup>, and J. Zenihiro<sup>14</sup>

<sup>1</sup>Research Center for Nuclear Physics (RCNP), Osaka University, Ibaraki, Osaka 567-0047, Japan

<sup>2</sup>School of Physics, University of the Witwatersrand, Johannesburg 2050, South Africa

<sup>3</sup>Department of Physics, Kyusyu University, Higashi, Fukuoka 812-8581, Japan

<sup>4</sup>Department of Physics, Osaka University, Toyonaka, Osaka 560-0043, Japan

<sup>5</sup>Department of Applied Physics, Miyazaki University, Miyazaki 889-2192, Japan

<sup>6</sup>Cyclotron and Radioisotope Center (CYRIC), Tohoku University, Sendai, Miyagi 980-8578 Japan

<sup>7</sup>Center for Nuclear Study, University of Tokyo, Wako, Saitama 351-0198, Japan

<sup>8</sup>Department of Physics, Chiba University, Chiba, Chiba 263-8522, Japan

<sup>9</sup>Institut für Kernphysik, Technische Universität Darmstadt, D-64289 Darmstadt, Germany

<sup>10</sup>iThemba LABS, Somerset West 7129, South Africa

<sup>11</sup>Instituto de Fisica Corpuscular, CSIC-Universidad de Valencia, E-46071 Valencia, Spain

<sup>12</sup>Department of Physics, Niigata University, Niigata, Niigata 950-2181, Japan

<sup>13</sup>Department of Physics, University of Tokyo, Bunkyo, Tokyo 113-0033, Japan

<sup>14</sup>Department of Physics, Kyoto University, Sakyo, Kyoto 606-8502, Japan

The  $M1$  quenching problem still has some unresolved subjects [1], while the quenching problem of  $1^+$  strengths has been revealed [2]. A comparison of  $M1$  quenching factors between isoscalar and isovector of  $1^+$  is essential for the problem of  $M1$ . We measured all even-even and  $N=Z$  nuclei as well as stable except for  $^4\text{He}$  by  $(p, p')$  reactions because both of isoscalar and isovector of  $1^+$  resonances would be observed at the same time. Their nuclei are  $^{16}\text{O}$ ,  $^{20}\text{Ne}$ ,  $^{24}\text{Mg}$ ,  $^{32}\text{S}$ ,  $^{36}\text{Ar}$ , and  $^{40}\text{Ca}$ , and we note that the data of  $^{12}\text{C}$  and  $^{28}\text{Si}$  were already taken at RCNP. Details of the experiment and the data reduction is described in Ref. [3]. Some developments were performed to prepare targets for high energy resolution measurements at  $0^\circ$  [4]. Preliminary results of  $0^\circ$  spectra are shown in Fig. 1. Calibrations and analysis to deduce  $1^+$  strengths are now in progress.

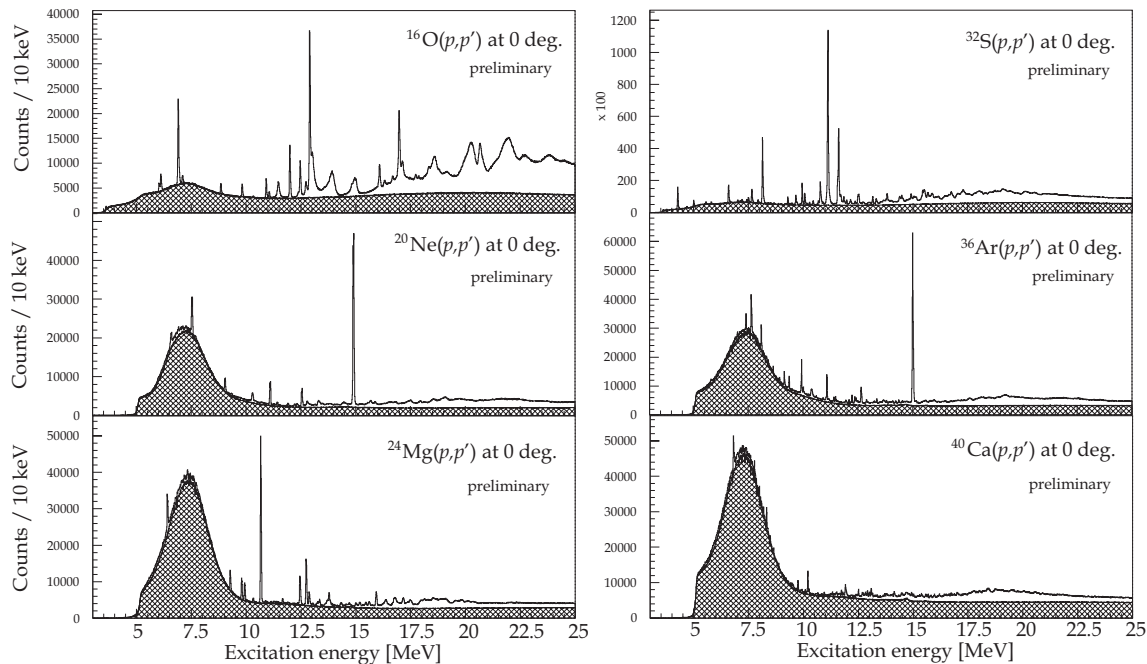


Figure 1: Typical spectra of the present measurement at  $0^\circ$  with full-acceptance of the GR are shown. The hatched areas indicate instrumental background events. A size of a bump seen at  $E_x = 7.5$  MeV depends on a beam transport condition. The spectra of  $^{20}\text{Ne}$  and  $^{36}\text{Ar}$  are contaminated from aramid windows [4].

### References

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