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**R. Taylor McNeill\*** ([rtm2@rice.edu](mailto:rtm2@rice.edu)), Mathematics Department, MS 136, Rice University, 6100 Main St, Houston, TX 77005. *A new filtration of the Magnus kernel of the Torelli group.*

For a surface  $\Sigma$ , the Torelli group is the group of orientation preserving homeomorphisms of  $\Sigma$  that induce the identity on homology. The Magnus representation represents the action on  $F/F''$  where  $F = \pi_1(\Sigma)$ . For many years it was unknown whether the Magnus representation of the Torelli group is faithful. In recent years there have been many developments on this front including the result of Church and Farb that the kernel of the Magnus representation, denoted  $K$ , is infinitely generated. I show that, not only is  $K$  highly non-trivial but that it also has a rich structure as a group. Specifically, I define an infinite filtration of  $K$  by subgroups, called the higher-order generalized Johnson subgroups. I show that for each  $n$ , there are elements in the  $n^{\text{th}}$  term but not the next term of the filtration. To do this, I define a higher-order generalized Johnson type homomorphism on each new subgroup and show it has a non-trivial image. (Received January 15, 2012)