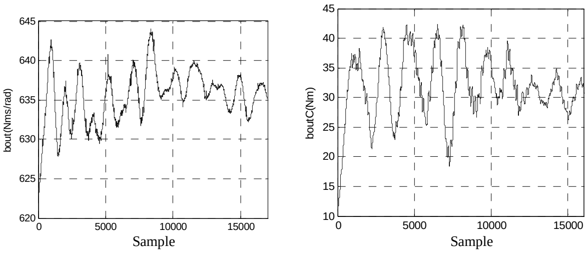

Figure 8. Output damping torque b_{out} and b_{inC}.

By changing the forgetting factor to adjust the convergent speed, the parameter is attempted to adjust during the course.

From the figures above, it is clear that the stiffness coefficients k_1 and k_2, the input damping torque coefficients b_{in} can b_{inD}, the output damping torque coefficients b_{out} and b_{outC} are all in convergence to expected values. The expected values are in accordance to the off-line parameters identification results, however, there are some fluctuation around the expected value, a little dig to the reason, in motion these parameters vary at different position or under this experiment the parameters are not well excited, what's more, the gear box has its weakness when transmitting and the magnetic powder brake also have some fluctuation.

VII. CONCLUSION

With flexibility and friction taking into account, a dynamic model is proposed; the off-line parameters identification investigation has been carried out based on the simplified model, and the result shows that Coulomb friction and damping model can better reflect the real joint dynamic feature. The RLS is presented, where a variable forgetting factor is introduced, then the on-line parameters identification has been investigated, and the result presents that the parameters can all reached to a stable expected value, and closed to the off-line results. The parameters identification can pave the way for joint control design.

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