# Notes on the function gsw_alpha_on_beta_CT_exact(SA,CT,p)

This function, **gsw_alpha_on_beta_CT_exact**(SA,CT,p), evaluates the ratio the thermal expansion coefficient with respect to constant Conservative Temperature $\Theta$, $\alpha^{\Theta}$, to the saline contraction coefficient at constant $\Theta$, $\beta^{\Theta}$. This function uses the full TEOS-10 Gibbs function $g(S_A, t, p)$ of IOC *et al*. (2010), being the sum of the IAPWS-09 and IAPWS-08 Gibbs functions. This function is essentially simply the following two lines of code, based on a call to **gsw_rho_alpha_beta_CT_exact(SA,CT,p)**.

```
[dummy, alpha_CT_exact, beta_CT_exact] = gsw_rho_alpha_beta_CT_exact(SA,CT,p);
alpha_on_beta_CT_exact = alpha_CT_exact./beta_CT_exact;
```

References

IAPWS, 2008: Release on the IAPWS Formulation 2008 for the Thermodynamic Properties of Seawater. The International Association for the Properties of Water and Steam. Berlin, Germany, September 2008, available from www.iapws.org. This Release is referred to in the text as **IAPWS-08**.

IAPWS, 2009: Supplementary Release on a Computationally Efficient Thermodynamic Formulation for Liquid Water for Oceanographic Use. The International Association for the Properties of Water and Steam. Doorwerth, The Netherlands, September 2009, available from http://www.iapws.org. This Release is referred to in the text as **IAPWS-09**.

IOC, SCOR and IAPSO, 2010: *The international thermodynamic equation of seawater – 2010: Calculation and use of thermodynamic properties*. Intergovernmental Oceanographic Commission, Manuals and Guides No. 56, UNESCO (English), 196 pp. Available from http://www.TEOS-10.org