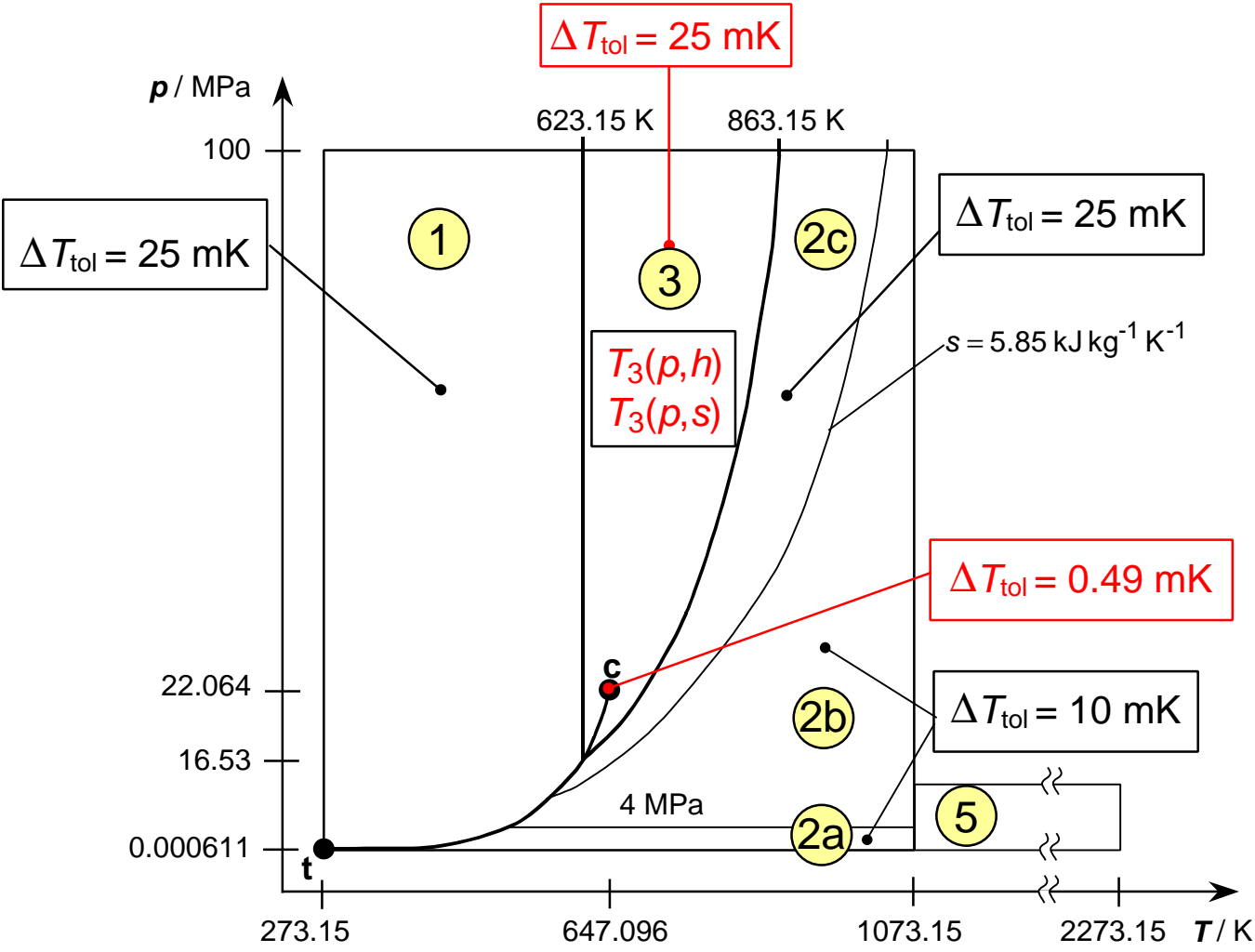


Task Group

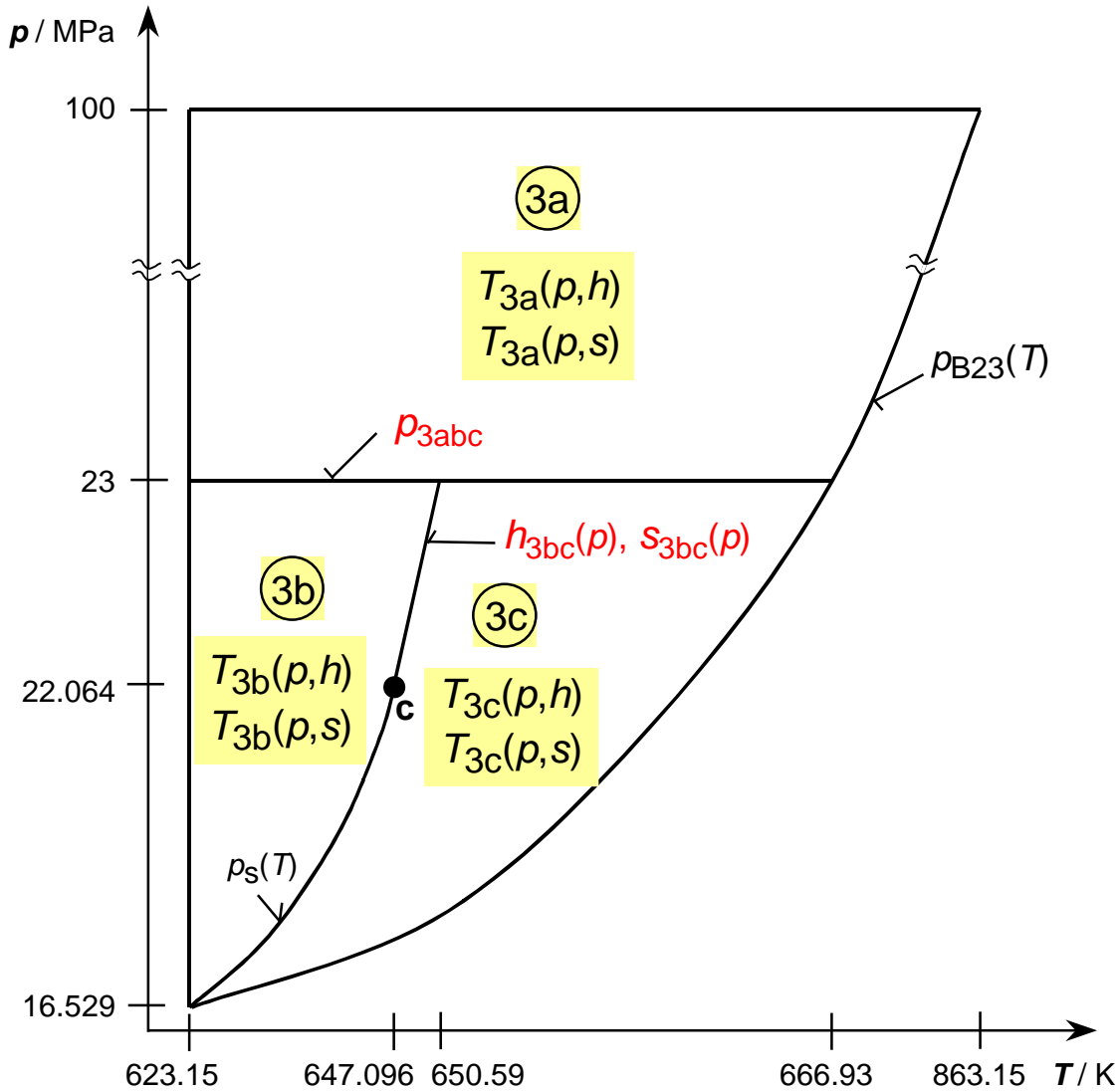
Supplementary Backward Equations for Region 3 of IAPWS–IF97

- Current Members: Hans-Joachim Kretzschmar (Chair)
Radim Mareš
Wolfgang Wagner
- Specifications for the Equations $T(p,h)$ and $T(p,s)$ – Gaithersburg, 2001
- Conclusions from the Discussion at IAPWS Meeting, Gaithersburg, 2001
- Proposal:
Supplementary Release on Backward Equations for the Functions $T(p,h)$, $v(p,h)$ and $T(p,s)$, $v(p,s)$ for the Critical and Supercritical Regions to the IAPWS Industrial Formulation 1997 for the Thermodynamic Properties of Water and Steam
- Membership

1. Numerical Consistency of $T(p,h)$ and $T(p,s)$ with IAPWS-IF97



2. Numerical Consistency at Boundaries Between Subregions



Subregion boundary:

p_{3abc}

$h_{3bc}(p)$

$s_{3bc}(p)$

Numerical Differences between adjacent backward equations:

$$\Delta T \leq 25 \text{ mK}$$

3. Computing Time in Relation to IAPWS-IF97

Computing Time Ratio - *CTR* Value

$$CTR = \frac{\text{Computing time of IAPWS-IF97}}{\text{Computing time of new equations}}$$

Calculation of $T_3(p,h)$: $CTR > 10$

Calculation of $T_3(p,s)$: $CTR > 10$

Conclusions

Basic Equation of Region 3 $f_3^{97}(v, T)$

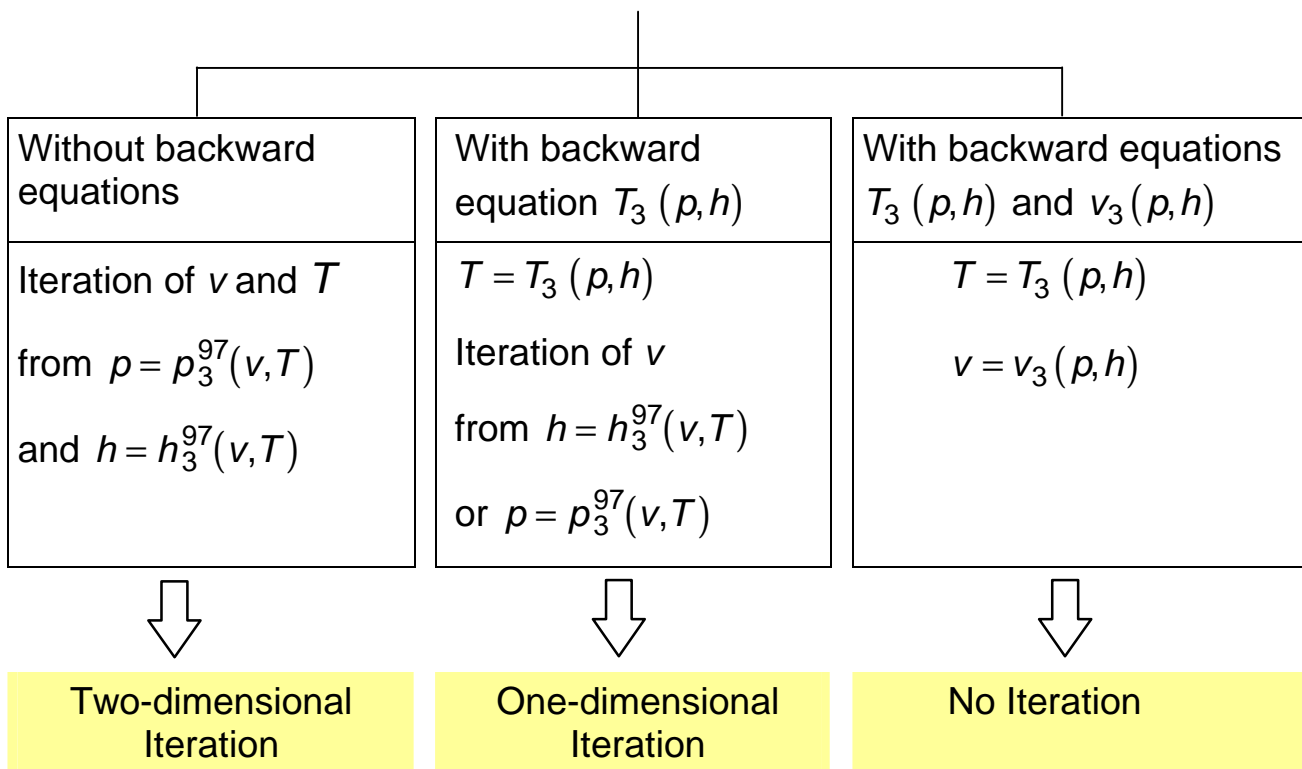
$$\begin{array}{l} \rightarrow p_3^{97}(v, T) \\ \rightarrow h_3^{97}(v, T) \\ \rightarrow s_3^{97}(v, T) \end{array}$$

$\Rightarrow v$ and T are required !

Backward Function – $p, h \rightarrow$ given Variables



v and T are required for calculation of other properties



\Rightarrow Backward equations $T_3(p, h)$ and $v_3(p, h)$ are required

Membership

Current Members: Hans-Joachim Kretzschmar (Chair)
Radim Mareš
Wolfgang Wagner

Proposal for Further Members:

Katja Knobloch, Zittau }
Ines Stöcker, Zittau } Zittau's Group