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Peres Akrawi Hartvig
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by

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July 2011

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Full Erratum for “Experimental Study of the Development of Scour and Backfilling”

Peres Akrawi Hartvig1,2, Jess McCann Thomsen3, Peter Frigaard1, Thomas Lykke Andersen1

This erratum concerns the paper of Hartvig et al. [2010]. Through recent work with the data from the paper, two general errors have been discovered, namely:

- The scour volume has inadvertently been over-estimated in the paper. This was because $V_{pile}$ was inadvertently added to the void volume rather than substracted as it should have been in the procedure described on p. 170-172. This error affects the reported values for the scour volume and scour shape factor, the fitting coefficients and some figures.
- The illustration of the scour shape factor was somewhat mistaken since it was realized that scour holes will not be perfectly geometrically similar during scouring since the pile dimension will remain unchanged – and therefore the hole is not scaled completely uniformly in all dimensions.

The above errors result in the following eleven corrections:

1) On p. 171-172, Tables 2-3 respectively, the existing values for the scour volume $V$ and the scour shape factor $\psi$ should be changed to:

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<th>$\psi$</th>
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<tr>
<td>A.02</td>
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<td>8-9</td>
</tr>
<tr>
<td>A.20</td>
<td>0.02</td>
<td>7-8</td>
</tr>
</tbody>
</table>

1 Aalborg University, Department of Civil Engineering, Sohngaardsholmsvej 57, 9000 Aalborg, Denmark
2 E-mail: pah@civil.aau.dk
3 Grontmij | Carl Bro A/S, Dusager 12, 8200 Århus N, Denmark
and

<table>
<thead>
<tr>
<th>Profile no.</th>
<th>V</th>
<th>Ψ</th>
</tr>
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<tr>
<td>B.19</td>
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</tr>
</tbody>
</table>

2) Figures 6, 11, 12, 13, 18, 19, 20 and 21 should be replaced with the present ones.

3) In Figs 8 and 15, the values for V should be replaced by the corresponding corrected values from the first of the above tables.

4) On p. 182, fifth line below section 6.1.1, “... a minimum value, equal to 8-9 in the present tests ...” should be changed to “... a minimum value, equal to 7-8 in the present tests ...”

5) On p. 182, “Once the scour shape factor has converged, the rate of scour depth is only affected by the rate of scour volume which can be deduced from (16) and can be seen in Fig. 12.” should be changed to “As the scour shape factor approaches the minimum limit, the rate of scour depth will be governed by the rate of scour volume which can be deduced from (16) and can be seen in Fig 12.”

6) On p. 184, Eq. (28), the values in the equation should be changed to:
\[
\begin{align*}
V_{0,A,01-02}/D^3 &= 0, \\
V_{0,A,05-08}/D^3 &= 0.4, \\
V_{0,A,11-14}/D^3 &= 5.8, \\
V_{0,B,01-02}/D^3 &= 0, \\
V_{0,B,01-08}/D^3 &= 2.3 \pm 0.1, \\
V_{0,B,14-17}/D^3 &= 12.9, \\
V_{0,A,01-02}/D^3 &= 13.7 \pm 0.7, \\
V_{0,A,05-08}/D^3 &= 9.5 \pm 1.2, \\
V_{0,A,11-14}/D^3 &= 0.42 \pm 0.05, \\
V_{0,B,01-02}/D^3 &= 8.9 \pm 0.8, \\
V_{0,B,14-17}/D^3 &= 0.21 \pm 0.03,
\end{align*}
\]

7) On p. 184, just below Eq. (28), “... weaker current, but this discrepancy is within the confidence range of the parameters.” should be changed to “... weaker current, and this trend exceeds the confidence range of \( t_v \).”

8) On p. 189, Eq. (35), the values in the equation should be changed to:

\[
\begin{align*}
\psi_{0,A,02-05} &= 11.2, \\
V_{0,A,02-05}/D^3 &= 1.7, \\
V_{0,A,08-11}/D^3 &= 7.5, \\
V_{0,A,08-11}/D^3 &= 1.8, \\
V_{0,A,14-17}/D^3 &= 12.9, \\
c_1 &= 250 \pm 81, \\
c_2 &= 1.9 \pm 0.1, \\
n &= 12
\end{align*}
\]

9) On p. 190, Eq. (36), the values in the equation should be changed to:

\[
\begin{align*}
V_{0,A,02-05}/D^3 &= 1.5, \\
V_{0,A,08-11}/D^3 &= 7.3, \\
V_{0,A,14-17}/D^3 &= 12.9, \\
V_{0}/D^3 &= 0.1 [0;1.3], \\
t_v &= 113 \pm 18, \\
t_v^* &= 5.0 \pm 0.8, \\
n &= 12
\end{align*}
\]

10) On p. 190, just below eq. (36), “Roughly speaking, the normalized time scale is \( t_v^* \approx 10^{-1} \) in the current-scoured tests and \( t_v^* \approx 10^{0} - 10^{1} \) in the wave-backfilled tests.” should be changed to “Roughly speaking, the normalized time scale is \( t_v^* \approx 10^{-1} \) in the current-scoured tests and \( t_v^* \approx 10^{0} \) in the wave-backfilled tests.”

11) On p. 191, just below eq. (38), “… that wave-current-backfilling in series E is about three times slower than current-scour in series A-B and about four times faster than the wave-backfilling in series A.” should be changed to “… that wave-current-backfilling in series E is about three times slower than current-scour in series A-B and about five times faster than the wave-backfilling in series A.”

References

Figure 6.
Initial values

\[ \psi = \frac{V}{S} \]

\[ U_c = 0.4 - 0.6 \text{m/s} \]

\[ U_c = 0.2 - 0.4 \text{m/s} \]

Figure 11.
Figure 12.
$K = 3$ for all

Figure 19.
Figure 20.
Figure 21.