compression performance that is rather competitive with the pyramidal de-
composition.
From an compression performance point of view, the compression-oriented
distribution are favourable, although, even these distributions severely de-
crease compression efficiency.

### 4 Computational Complexity

In order to compare the computational complexity of KDWP encryption com-
pared to conventional compression and encryption it is sufficient to determine
the difference. The main difference between KDWP encryption and conven-
tional compression and encryption is the transform stage, a random WP is
chosen for KDWP encryption, while in a conventional encryption approach
the pyramidal decomposition is employed. In the commonly applied PCRDO
coding approach (post-compression-rate-distortion optimization) the complex-
ity of the remaining compression (labelled “RCompression” in fig. 2) is almost

![Graph showing PSNR vs Rate for different decomposition methods.](image)

**Fig. 3** Empirical results: average compression performance (100 images)

<table>
<thead>
<tr>
<th>Rate</th>
<th>pyramidal</th>
<th>iso</th>
<th>aniso</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.125</td>
<td>15.9%</td>
<td>32.8%</td>
<td>20.8%</td>
</tr>
<tr>
<td>0.25</td>
<td>10.0%</td>
<td>20.8%</td>
<td>15.1%</td>
</tr>
<tr>
<td>0.5</td>
<td>6.1%</td>
<td>13.6%</td>
<td>9.6%</td>
</tr>
<tr>
<td>1</td>
<td>3.7%</td>
<td>9.2%</td>
<td>5.9%</td>
</tr>
<tr>
<td>2</td>
<td>2.5%</td>
<td>6.4%</td>
<td>3.9%</td>
</tr>
</tbody>
</table>

**Table 1** Ratio of header data to packet data for different compression rates (16 quality layers)