11.2 By following the argument of Prob. 11.1(c), the constancy of $|h(v^2)/f(v^2)|$ is straightforward.

Consider the reference frames in the problem, then we must have

$$v_3 = \frac{v_1 + v_2}{1 + v_1 v_2 h(v_1^2)/f(v_1^2)}$$

Now, if K' moves with velocity v_2 w.r.t. K, and K'' with v_1 w.r.t. K', then

$$v_3' = \frac{v_2 + v_1}{1 + v_2 v_1 h(v_2^2)/f(v_2^2)}$$

We must have $v_3 = v_3'$, due to the group nature of the transformation, then it is obvious

$$\frac{h(v_1^2)}{f(v_1^2)} = \frac{h(v_2^2)}{f(v_2^2)},$$ which means, $|h(v^2)/f(v^2)|$ is a universal constant. By dimensional analysis, it must have the dimension of inverse speed squared.